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by FRANCIS X. WELCH WASHINGTON EDITOR

Telephone companies now receiving questionnaires as part of congressional study before action on proposed legislation to allow federal aid to utilities for relocation expenses incident to federal-aid highway construction . . . prompt answers will be advantageous. Feels new Atomic Energy Law is a good law. Summary of audit on two years of REA operations.

TELEPHONE companies, as well as the gas, electric, telegraph, and water companies are receiving about now a questionnaire from the U. S. Bureau of Public Roads. It goes without saying that it is no novelty for any company to get a request from some federal bureau or other agency for information. But this is one questionnaire which it will be very much to the advantage of the telephone companies to answer fully and promptly.

It deals with the costs incurred by these utility companies as the result of relocating pole lines or other facilities due to highway construction. It grew out of the decision made by the recently adjourned Congress to have a study made before taking action on proposed legislation to allow federal aid for highway construction to be used for compensating utility companies for relocation expenses due to the construction of federal-aid highways. Railroad companies already shared in the federal aid, but the other utility industries must bear such relocation expenses entirely under present law.

Since the U. S. Bureau of Public Roads has always been "highway-minded," the feeling among utility people in Washington has been that the study would give the utilities' position a better break if it were sent elsewhere. The Bureau of Public Roads has tended to the view that any funds appropriated by Congress ought to be spent for highways, one hundred cents out of the dollar, with no diversions or subtractions for collateral expenses, if at all avoidable. Congress voted to put the study under the Secretary of Commerce. But the Secretary of Commerce turned right around and deputized the U. S. Bureau of Public Roads to make the study. So, we're back where we started on that.

On Aug. 20, a private meeting was held by the U. S. Bureau of Public Roads with representatives of various utility industries. The main item discussed was a questionnaire to be sent out to all utilities seeking data on relocation expenses actually incurred as the result of highway construction. Answers to these questionnaires will go a long way towards influencing the kind of report or recommendation the Secretary of Commerce will make to the next Congress. And what he has to say, in turn, will have an important bearing on what kind of legislation, if any, Congress sees fit to pass.

The utility representations at the Bureau of Public Roads meeting were able to agree on the form of the questionnaire. That should indicate that it is not loaded or slanted. So, if the telephone companies ever expect to be relieved, in part at least, by federal aid from the burden of relocation expense, the thing to do is to give this questionnaire priority attention. Individual companies are being contacted by special state utility committees, which are being formed in all states to deal with this matter. They will be equipped with the necessary copies and instructions for the individual companies to fill out.

The New Atomic Energy Law

Since writing on the subject earlier in this department, your correspondent has received several letters and inquiries from TELEPHONY readers about the new Atomic Energy Law passed by the recent Congress. The gist of these inquiries is: "What did Congress finally do about it—is it still a good deal for private enterprise or did the public ownership Congressmen louse it up?"

On the balance, this writer is inclined to the view that the law, as finally passed, is a good law. True, the left-wingers did succeed in putting in language authorizing the Atomic Energy Commission to go into the new atomic energy business—if, as, and when it is proven to be practical. True, the same crowd also got in a "preference" clause whereby surplus power from such AEC plants would be sold by "preference" to publicly owned utilities and cooperatives. There was also a time concession on patents.

But these concessions were hedged about with limitations which should prove effective, unless future interpretations should destroy the plain intent of Congress. AEC, for example, is expressly forbidden to go into regular commercial operation of atomic plants, and must restrict its production to its own needs or to experimental purposes.

Under such circumstances, if the law is obeyed, the future AEC plants should not be much of a threat to private enterprise even though there is a public agency preference. The reason for that is that private companies will be issued licenses to build their *own* atomic energy plants.

That, after all, is the real heart of the new law as far as the domestic (as distinguished from the foreign) phases of the legislation are concerned. The law is designed to end the government's monopoly on the commercial application of atomic development when it becomes practicable. That will probably be within 10 or 15 years.

The stakes are high! Indeed the new law passed by the 83rd Congress may well go down in history as the most important law passed. For the day is coming when atomic energy will account for not only our electricity but also our heating, lighting, air-conditioning and many other services now performed by public utilities using such conventional fuels as coal, oil, natural gas, or hydroelectricity. Obviously the question of who should control the basic source of this magical genie-of-the-lamp is an all-important one.

Our nation stands today at the gate-

way of a new era, comparable with the beginning of the industrial revolution of the nineteenth century. It might also be compared to the more recent dawn of modern utility services, with the inventions of Edison and Bell, and the Wright brothers, and the automobile. Would we today be able to boast of far and away the best and most utility services in all the world, if we had then taken the road of government monopoly followed by so many nations of Europe? It is a hard question to answer; but the very comparison speaks volumes.

Today we have an even harder decision: Whether to throw open this new frontier of the atom to pioneering development of private enterprise, just as our federal government threw open the public lands of the West to the homesteaders a half-century or more ago. Or, whether a federal government should hold fast to a monopoly born of war emergency and bury the golden talent of the taxpayers' investment in the sterile confines of state management, planning, and restriction. That is the question posed by the new Atomic Energy Amendments Law of 1954!

Audit on REA Expenses

One of the difficulties of comparing REA financing with any other kind of financing is the question of hidden costs. Hidden costs are not expenses which are not incurred, but rather expenses which are put on somebody else's bill, besides the person getting the benefits.

When a commercial bank makes a loan it has to make enough on that part of its business to carry a proper share of the banks' operating expenses, including payroll, office building, and other items commonly referred to as housekeeping expenses. But REA can put these expenses on the taxpayers' bill and those who borrow from REA get the benefits "net"—that is, without having to defray that part of the cost of REA doing business.

This is legal enough. And from a policy standpoint, it is perhaps properly in line with the intent of Congress to help the farmer. But it is not an item which should be overlooked as if it did not exist.

A recent independent audit to Congress on REA's operations for the fiscal years ended June 30, 1951, and June 30, 1952, gives us a peep behind the scene into this rarely illuminated aspect of REA operations. According to this audit, by the comptroller general of the United States, or General Accounting Office (GAO), administration or "housekeeping expenses" for REA loans over a period of 17 years have cost 80 million dollars. This amount, which includes REA payroll, office operations, as well as losses due to bad loans, will never be offset by apportionment to the borrowers. These items, in other words, are borne by the federal taxpayer as indirect subsidies for REA financing programs of rural electrification and telephones.

REA borrowers are not required to make repayments as part of their loan payments or any extra charges for such REA expenditures. As a result, REA's activities have accumulated a loss of about 67 million dollars for administration, plus about 11 million dollars in services from other agencies of government and about $500,000 for office equipment. This totals 78½ million dollars. About 1½ million dollars anticipated possible loss on loans through defaults, etc., was estimated to make a total expense attributable to REA operation of 80 million dollars.

An REA financial reorganization is under way. When it is completed many services rendered by REA, in the past without charge, may be put on the borrower's bill. Under the GAO order of late 1953, many government agencies will take steps to pass on service costs to those who seek federal help, in the form of license charges, inspection fees, etc.

While past experience provides no firm basis for estimating possible loan defaults, the GAO report comments: "We believe that this estimate (1½ million dollars) may be substantially understated, particularly because of the increasing debt repayment requirements confronting about one-fourth of the borrowers which are showing current and accumulated operating deficits.

On the question of interest rates on REA loans compared with what it cost the Treasury to borrow money used by REA, the comptroller general's report states:

"Under existing law any interest paid by REA on its borrowings from the Treasury may not exceed 2 per cent per annum. Since July 1, 1947, REA has paid interest at rates established by the Secretary of the Treasury at the multiple of one-eighth of one per cent lower than the Treasury's average interest rate on outstanding marketable public debt obligations. Thus, the interest paid by REA generally is less than the Treasury's cost of obtaining funds."

This is an official statement by the chief accounting officer of the United States government. It should set at rest repeated denials made by zealots in favor of federal favors for the farmer to the effect that REA is paying back "every cent to the taxpayer," including full interest on the obligations incurred in rural telephone loans.

Under the 1936 act, REA originally borrowed funds from the Reconstruction Finance Corporation (RFC) at an interest rate of 3 per cent per annum. On Sept. 21, 1944, the interest rate was reduced to 1¾ per cent per annum by the Department of Agriculture Organic Act of 1944. The period of the RFC loans was not specified in the original act, but they were first made for terms of 20 years and from 1938 to 1942 for terms of 25 years. After Sept. 21, 1944, RFC made loans to REA for 35-year periods, which coincided with the maximum period for REA loans to electrification borrowers.

The 1948 appropriation act directed the Secretary of the Treasury to make loans to REA, upon the approval of the Secretary of Agriculture, beginning with the fiscal year 1948, in amounts as authorized by the Congress. The act provided that the loans may be made either without interest or at an annual rate as determined by the Secretary of the Treasury, not in excess of 2 per cent.

On Aug. 6, 1947, the secretaries of Agriculture and the Treasury entered into an agreement (modified, effective July 1, 1950) providing for the advance of funds to REA by the Treasury. In accordance with the agreement, the Secretary of the Treasury accepts 40-year promissory notes from REA, subject to interest during each fiscal year at the July 1 average rate on the outstanding marketable public debt obligations of the United States, but not in excess of 2 per cent. If the average rate is other than a multiple of one-eighth of one per cent, the effective rate is established at the next lower multiple.

All moneys collected by REA from its borrowers are deposited in a special Treasury account from which the administrator makes periodic payments of principal and interest to the Treasury. The Treasury allows interest credit for collections deposited by REA as well as for cash balances deposited to REA's account but not withdrawn.

Under this procedure REA is charged interest only on the net amount of money used for lending purposes. Accrued interest is settled on June 30 and Dec. 31 each year.

The administrator holds the obligations of REA borrowers in trust as security for Treasury loans, but he may take any action deemed necessary or advantageous in respect to any security items without notice to the Treasury. At June 30, 1952, the balance of REA's loan obligation to the Treasury was $1,731,326,080, secured by obligations of REA borrowers in the principal amount of $1,831,176,021. This latter

(Please turn to page 34)

CARRIER SYSTEMS

By HAROLD B. McKAY

Part 7—Power Supplies

THE PRINCIPLE power requirements for a carrier system are two voltages — a low voltage for the vacuum tube heaters or filaments, and a higher voltage for the plates of the tubes. In addition, any telephone relays or auxiliary circuits which may be associated with the carrier would require the same voltages that such units of apparatus would require if they were not connected to the carrier.

The vacuum tubes require a heater or filament voltage which may be as low as six, or as high as 20, depending on tube types used. This voltage may be either ac or dc in different circumstances.

The tube plates are usually supplied from a 130-volt dc source. These voltages may derive from central office battery supplies, or from an ac operated power supply which is part of, or an accessory to, the carrier equipment.

The 24 or 48-volt central office battery may be used for the tube filaments, which may be connected in series, if necessary to make the voltage equal to the battery voltage. The 130-volt supply may be taken from a battery of this voltage, if the office already has one for voice frequency repeaters. Under these circumstances, the carrier would be supplied entirely from the central office facilities.

The ac power pack used with carriers consists essentially of the same parts as used in the power supply of a radio set. There is a transformer that steps the 110-volt supply down to 6 volts for the tube heaters. There is also a winding which steps up the voltage to a value that is somewhat greater than twice the required dc voltage for the tube plates. This winding is connected to a vacuum tube which provides full-wave rectification. It is usually a dual-unit tube; that is, it contains two two-element vacuum tube units inside the same glass enclosure. These elements are a plate and a filament. One unit rectifies one polarity of the ac current, the other rectifies when the current reverses. Some voltage drop occurs in these tubes, which is one of the reasons why the transformer must be of higher voltage than the dc required.

The output of such a tube and transformer rectifying device is a rough dc current, which contains a "ripple" of the ac current at 120 cycles per second. This must be smoothed out to pure dc before it can be used in a carrier. This is accomplished by the use of large condensers of several microfarads, and one or more choke coils.

When central office dc potentials are used for power, smoothing filters of similar type to those described above may also be needed if the battery supply is noisy. One carrier manufacturer makes a unit with a built-in power supply, which will work on either central office battery or 110 volts ac (by changing strap connections on the unit). In this system the same filter chokes and condensers that are used by the ac power pack are also used to smooth the central office battery voltage.

Fuses

While it has been said that the power supply is almost identical, circuit-wise, with that contained in an ordinary radio, the telephone carrier equipment frequently has fuses not found in a radio. This is especially true of systems using the central office battery for supply.

It should be mentioned, then, that in probing in such power supply with a test receiver, it is very easy to blow the fuse on the 130-volt supply. This is because this fuse may be a fraction of an ampere in size, and 130 volts through a telephone receiver will pass more than an ampere, which will blow the fuse. This may be of serious consequence if the fuse supplies more than one carrier channel, which sometimes is the case.

Workmen who maintain carrier equipment should also remember that the voltages encountered, particularly the more than 300 volts which might be found in the ac power supply transformer, are higher voltages than those usually encountered in telephone work. Due caution should therefore be exercised.

Repeaters

Carrier systems require a repeater or amplifier to boost up the signals and voice if they go beyond a certain distance. This distance varies with the system and the type of outside plant involved. Some cable transmitted systems, require a repeater or booster station every 8 miles. Some wire line systems will transmit for over 100 miles before a repeater is needed.

These repeaters are vacuum tube amplifiers which require the same voltages as the carrier equipment at the terminals does. Usually, unless the repeater is conveniently mounted in another central office, this means that an ac power supply must be available, and the transformer type rectifier would be used. To assure continuity of service in the event of power failure, low voltage batteries with a motor generator set to provide the 130 volts may be used. This is usually not practical, however, where the repeater is mounted on a pole.

However, some carrier systems have provisions for sending the power required by the repeater over the physi-

cal wire line on which the carrier frequencies travel. This can be done by sending a high voltage over a simplex circuit. The voltage must be high enough to overcome the resistance losses of the wire line. Both filament and plate supply can be furnished by this method.

Frequency Modulation

Earlier in this series, the action of a modulator, the device which puts the voice and the carrier frequencies together, was described. This type of modulator operated on the principle of "amplitude" modulation; that is, the amplitude or voltage of the carrier as transmitted over the line varied up and down as the voice varied up and down. This is the method of modulation which is used by radio stations and other services including most telephone carrier systems.

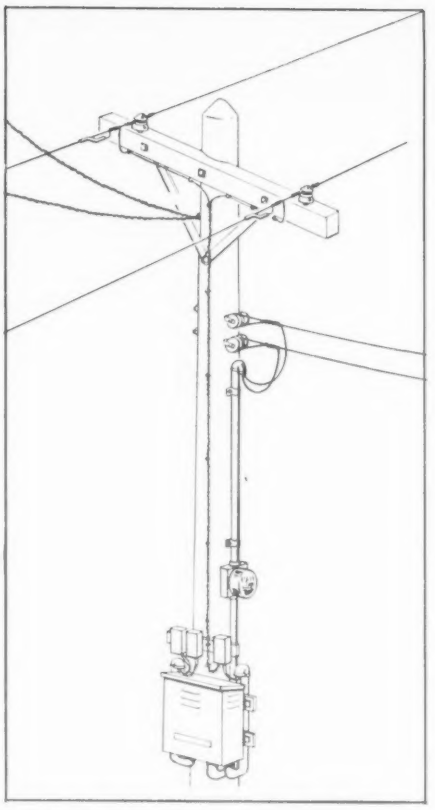
Another method of modulation has long been known, but only in recent years has it been put to practice. This is "frequency" modulation. With this system, the frequency, rather than the voltage of the transmitted carrier, is made to vary with the voice.

This can be accomplished electrically by any device which will change the frequency of the oscillator which generates the carrier. With the crystal oscillator, described earlier, the frequency is dependent upon the dimensions of the quartz crystal in the oscillator circuit. However, if any capacitive effect is introduced into the crystal circuit, the frequency can be made to deviate slightly.

In practice, this can be accomplished by the use of another vacuum tube in the circuit, which is so connected that it *appears* as a reactance to the oscillator circuit. This seeming reactance can be made to change by introducing a voice signal into the tube; the fluctuations of the voice will cause the frequency of the oscillator to fluctuate also. An important point here is that the number of cycles that the oscillator changes its frequency, is not necessarily the same as the frequency of the voice causing the change. In fact in FM broadcast stations, a few cycles of voice frequency change may result in hundreds of cycles change in the carrier frequency. The amount that the carrier frequency changes or swings during modulation is called "deviation."

A frequency modulated signal can be received or detected by various devices. Detection must take place because ultimately the voice must be reproduced in a telephone receiver, which responds to voltage and current changes.

Therefore, the received FM signal must be changed to a fluctuating voltage and current. Among other methods,



Remote channel units on subscriber line carrier systems may be mounted on a pole. Note the single open wire circuit on the cross-arm which connects the unit to the office. To the left are drops to subscribers, and the ac power service is on the left. (Drawing courtesy of North Electric Mfg. Co.)

this can be done by sending the frequency modulated current into a type of tuned circuit or filter, which is sharply tuned to the base carrier frequency (without modulation). When the incoming frequency changes, the amount of current and, hence, the voltage drop across this tuned circuit, will change also as the incoming carrier goes in or out of tune with the filter.

This change in voltage and current can be amplified and applied to a telephone circuit which will receive the voice.

The advantage of frequency modulation is that it is relatively free from noise effects. This is because most noise is amplitude modulated in nature. That is, noise or interference which can get into a radio or carrier circuit is mostly a foreign voltage that is varying in strength. Therefore, if a receiver were used which would not respond to changes of signal voltage, it would not receive the noise. Further, if the received carrier fades because of space or wire line transmission difficulties, theoretically, this should not affect the volume of voice as heard by the listener. This is because fading means that the carrier voltage is becoming weaker. If the receiver does not recognize changes in voltage, but only changes in frequency, the receiver will not be affected by the reduced voltage during a fade.

In actual practice, the above holds true only within limits. If the received carrier drops below a certain level, both fading and noise can be heard by the listener. Anyone who has listened to a weak FM radio station has had this experience.

While a number of FM radio stations have been built in recent years, and microwave systems use this system, frequency modulation is a somewhat new idea in wire line carrier systems. This method of modulation has now been applied to subscriber line systems where it is claimed that it will permit the use of wire plant which would not ordinarily handle amplitude modulated systems.

Subscriber Line Carrier

One of the more important recent developments in carrier telephony has been the subscriber line carrier. These systems serve an immediate need with many Independent companies, because they permit connection to new subscribers without building additional wire line plant. Electrically, subscriber line carriers are the same as other types of carrier. That is, they are devices for modulating the voice with a carrier frequency and, by this means, send several conversations over the same wire line.

In the past, carrier has been used principally on long-haul circuits—usually toll circuits. In any event, they usually terminated in a central office at each end.

A subscriber line carrier has a central office at one end, but the other terminals may be at several points along a pole line, either mounted on the poles or located in customers premises.

These systems may have four or five channels, each of which uses a separate carrier frequency for transmitting and receiving. In a typical installation, the central office end might have four channels mounted in a bay, connected to a wire line. A big advantage of these systems is that the wire line might already have eight parties on it, which were there before the carrier was installed.

These parties will remain connected and operate as they always did and not utilize the carrier system. However, line filters will be required where each drop takes off of the wire line, to prevent the subscriber's subset equipment from absorbing the carrier power. With the carrier thus installed "on top" of an existing party line, each of the four or five carrier channels can, in turn, be used for a party line. Thus, with a four-channel system, and 10-party lines, 40 more subscribers could be con-

nected to a wire line which had already been serving its full quota of stations on a metallic basis.

The remote terminals which would be located along the line can be located in different places; that is, each of the four separate channel terminals could be connected to the wire line at a point where it could serve the most customers. In some cases, this might mean building additional wire from the new subscriber to the point where the carrier terminal would be mounted, but it would not have to be built back into the office.

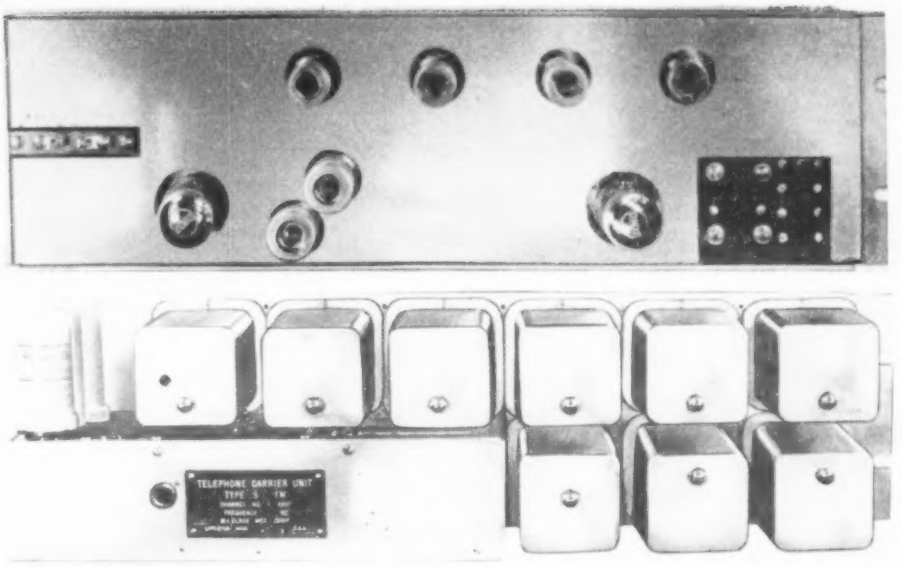
Each of these carrier terminals, regardless of where mounted, will require power, which will involve a certain expense. When mounted on a customer's premises some allowance might have to be made on the bill for the power consumed, even though it is only a few watts.

In some locations, the use of subscriber line carrier may solve a problem which otherwise could be answered only with a community dial office.

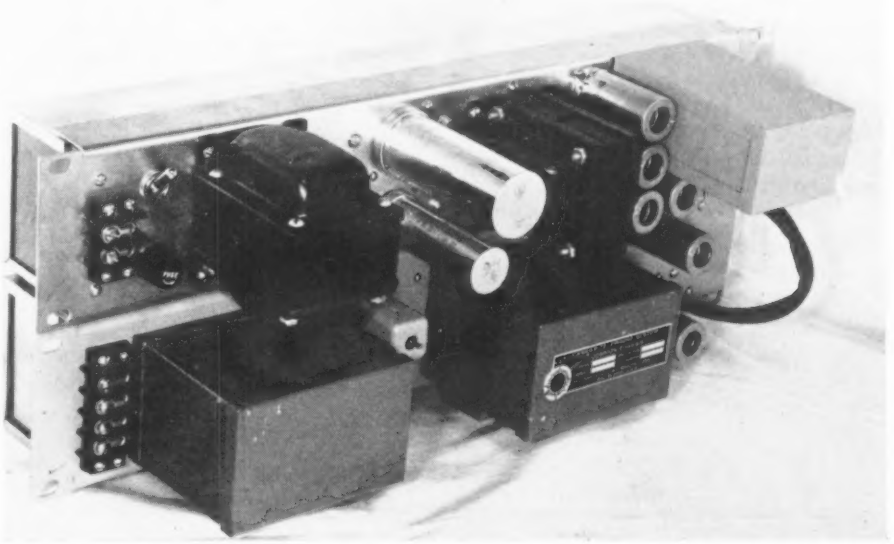
As mentioned before, the subscriber line carrier is essentially the same electrically as any other type of carrier. However, the subscriber carrier has provisions for the various types of ringing which may be required. Also, dial pulses may be transmitted over it for connection to a dial office.

In some systems, dial pulses are transmitted by interrupting the carrier frequency by the dial pulses, thus enabling signalling over any circuit that will carry voice. Ringing, which can include the different types and frequencies now used, is accomplished in some systems by transmitting the ringing signal right over the voice channel, by modulating the carrier with the ringing frequency. Thus no special signal channel is required as is in the case of some inter-office carrier systems.

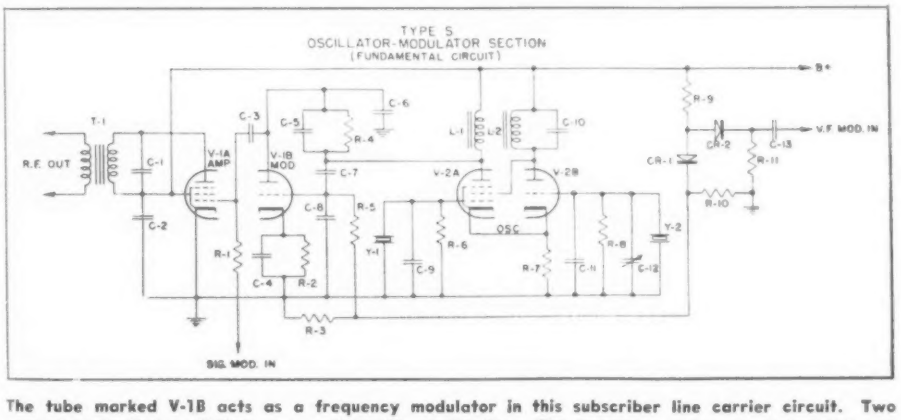
The subscriber line carrier systems are quite flexible in application, and can be ordered on an individual channel basis. That is, only one channel, involving one central office terminal and one outside terminal, need be placed if this is all that is warranted. As additional potential subscribers call for service along the line, additional channel units can be installed on this same line to serve them.



Front and rear views of frequency modulated subscriber line carrier channel. Note the single screwdriver type adjustment required on this unit. This adjustment is for volume level. (Photos courtesy of McElroy Mfg. Corp.)



The subscriber terminal of a carrier telephone system resembles the central office equipment in many respects. (Photo courtesy of North Electric Mfg. Co.)



The tube marked V-1B acts as a frequency modulator in this subscriber line carrier circuit. Two crystal controlled oscillators are used in this application. The quartz crystals are marked Y-1 and Y-2. (Drawing courtesy of McElroy Mfg. Corp.)

Installation of these systems, like other telephone facilities is usually engineered on a basis of both present and potential subscribers. An accurate survey and estimate of expected growth is useful in determining where the outside terminals are to be located.

Perhaps, it should be mentioned that these subscriber systems at present are designed for operation on open wire lines. There are some cases, however, where the telephone company may use cable from the central office to the edge of town, at which point the open wire line is used. If subscriber line carrier is used on such circuits, the cable, if

(Please turn to page 34)

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

WE ARE INDEBTED to C. S. Rhoads, REA telephone engineer, for a report of an experiment conducted by the New York Telephone Co. on the use of switchboard type cable for tip cables. These experiments were conducted in exchanges where the distribution entered the exchange aerially.

This arrangement was tried for the purpose of reducing the cost of tip splices. Three such installations were made in the vicinity of Albany in which pressure plugs would have been standard regardless of the type of tip splice used to prevent "breathing" through the underground dip to the aerial cable plant.

The completed splices were muslin-wrapped with two half-lapped layers of 2-inch rubber tape and two half-lapped layers of 2-inch friction tape. After raising the splice to its final position, the tape was painted with a clear shellac.

In the setting up process, each 101-pair tip cable was encircled with a "worm" of Plastic Duct Seal after which all the tip cables were lashed into the desired cluster with the duct seal serving as a cushion-spacer and interstice filler.

Since the tip cables were not waterproof, no attempt was made to waterproof the tip splice. Moreover, since the pressure plugs are so close, it is not anticipated that there will be any damage caused by breathing either through the taped splice or through the tip cable butts.

• • •

The increased use of the outdoor type public telephone booth in this country in recent years has been no less than phenomenal. Before World War II, they were almost considered an oddity, but now they may be seen on almost any business street in any town of any size throughout the country.

It is claimed that for every three persons who use an indoor public telephone, four make use of the outdoor variety. Revenue records indicate that the installation of new outdoor booths in a neighborhood has no effect on the number of calls made from indoor public telephones. This, then is new business.

The popularity of these outdoor booths in recent years is in reality no mystery. A few years ago, when darkness fell, the movement of people diminished. Places of business closed, streets were deserted and highways were used very little. In consequence, the need for public telephones was not great.

However, today things are different, with technological improvements in industry and transportation, good highways and an increased number of consumer outlets, people are on the move everywhere 24 hours a day. The outdoor public telephone booth makes it easier for people to telephone and in consequence they use it oftener.

• • •

A clear, ready-mixed, chemical-type leak-detector, developed for routining and flash-testing all types of telephone and coaxial cable is now available.

This is a general-purpose detector, designed to meet the requirements for testing all types of lead and plastic-covered cable at any temperature. The manufacturer states that it contains no oil, grease or soap, and is a true solution requiring no mixing.

Although this fluid, known as Sherlock, is new to the communications field, it has been well-established for years in many other fields; namely, gas plants, tank manufacturing, automobile industry, aircraft plants, oil companies, ship-building and refrigeration.

The new Sherlock, Type C, developed in cooperation with the cable and telephone companies especially for use with lead and plastic-covered cables claims the following advantages:

(1) A leak detector that will detect much finer leaks than is possible with any other known fluid.

(2) Requires no mixing. Always ready for instant use.

(3) Applied as a clear liquid, it removes the confusion of suds and greatly simplifies the detection of small leaks.

(4) Sherlock forms a very tough but slow-drying bubble cluster that continues to build up at the leak for half an hour or more, even in the wind, making it possible to test long lengths of cable at high speed with the certainty of detecting all leaks.

(5) This fluid penetrates weather films that often temporarily cover small leaks. Thus, it detects small leaks that are frequently missed by older methods of testing.

(6) It dries clean — does not leave greasy or soapy residue. It is clean to handle and is quickly removed from anything with plain cold water.

Sherlock is applied to the outside of pressurized connections or surfaces suspected of leaking with a dauber or brush; or it may be squirted on with an oil can or pressure oiler.

Large leaks form clusters of large bubbles. Small leaks form patches of white foam that are clearly visible from a considerable distance.

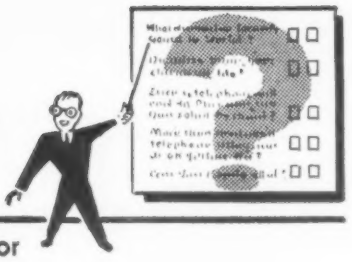
It is a neutral solution that is non-corrosive, non-inflammable and non-injurious to lead, plastics, rubber, enamels, paints or the skin.

Sherlock is furnished in a four-ounce glass dispenser with dauber cap, or in bulk quantities — gallons, five-gallon cans, 10-gallon cans and 55-gallon drums.

• • •

Out in San Francisco recently, we attended an installation where the telephone number of the fire department was printed on all fire extinguishers. This appears to be a good idea. For when anyone has occasion to use a fire extinguisher, and it does not prove effective, the next action is to call the fire department. In this event, seconds count and time lost in looking up a telephone number might mean the loss of a building.

PLANT MAN'S QUIZ



by RAY BLAIN, Technical Editor

Q. Will the moisture content of soil seriously affect a ground connection?

A. The moisture content of the soil is of great importance. A variation of a few per cent in moisture will make a marked difference in the effectiveness of a ground connection made with electrodes of a given size. This is especially true for moisture contents below about 20 per cent.

Experimental tests made in red clay soil indicated that with only 12 per cent moisture content, the resistivity was over 30 times that of the same soil having a moisture content of about 20 per cent.

For values over 20 per cent, the resistivity is not affected too much, but below 20 per cent, the resistivity increases rapidly with a decreasing moisture content. The normal moisture content varies for different localities, but on the average it is about 10 per cent in dry seasons and around 36 per cent in wet seasons with an approximate average of about 16 to 18 per cent.

• • •

Q. Will plastic-jacketed cable prove suitable to bury in the ground without any type of mechanical protection?

A. We have had information on numerous installations of buried plastic cable that have proved entirely satisfactory.

It is important that you specify that the cable is intended for this type of construction in order that the supplier will be certain to provide a type designed specifically for such a purpose.

• • •

Q. Please explain the difference in the terms plus and minus decibels as used in transmission studies.

A. A reference power level, to which any power level can be compared, has been established which makes possible the expression of an actual power level in terms of the decibel system.

The unit of measurement is dbm, the "m" indicating milliwatt. "O dbm" is one milliwatt (one one-thousandth of a watt) of power. The phrase "6 dbm" expresses a loss or gain, but not a power level. Actually, this specifies a specific amount of power that is 6 db greater than O dbm; or approximately 4 milliwatts.

Thus, if the power level at the input of a circuit is 20 dbm and the power level at the far end of the circuit is 12 dbm, the circuit has an 8 db loss. The 20 dbm can be read directly from meters. The difference between input in dbm and the output in dbm is the circuit loss in db.

Power levels below O dbm are expressed with a minus sign. A 5 dbm signal, if attenuated 13 db, would supply—8 dbm power.

• • •

Q. Will it be possible to purchase a machine that will punch out three-digit number plates for use in pole numbering on a rural line?

A. We do not have any information on a machine of this type. Further, we doubt that it would prove practical. Aluminum cutout numerals may be procured which can be nailed on poles and, in our opinion, will prove more economical and do a better job.

Pole numbers should be of sufficient size that they can be seen from a moving automobile as it is driven along the line. A three-digit number plate might also prove a hazard to climbing and cause accidents.

"I'D BETTER HANG UP NOW, MARTHA. HENRY HAS A VERY PAINFUL RULE ABOUT TALKING OVER FIVE MINUTES."

Q. We have experienced considerable trouble of late as a result of cable having been damaged in transit. The lagging is broken to such an extent that the lead sheath of the cable is seriously damaged. Do you have any idea as to how this difficulty may be avoided?

A. We have consulted two different cable manufacturers on this subject and they have suggested that a certain number of metal lags be provided. If about every sixth or eighth lag is metal, they should carry the strain and prevent the wood lagging from breaking.

Such an arrangement should not prove overly expensive and should prove less costly than damaged cable in all cases.

• • •

Q. What is the meaning of the term "supervisory limits" used in connection with transmission studies on telephone circuits?

A. Transmission considerations are not in all cases the controlling factors in the design of telephone plant. The relays in a subscriber's line circuit are designed to operate on certain minimum current values, and the over-all resistance of a subscriber's loop must be kept low enough to permit at least this amount of current to flow when the switchhook contacts are closed if faulty operation of the relays is to be avoided.

Consequently, in some cases, it is necessary to provide larger cable conductors in the customer's loops to meet the requirements for satisfactory supervision than would be required if transmission limitations alone were being considered.

• • •

Q. We must install an aerial cable near a rock quarry and we fear that the lead sheath may be damaged from flying rock particles as a result of blasting. Due to the rocky nature of the soil in this particular locality, underground construction would prove most difficult and expensive. Please advise us what type of protection is considered necessary for the aerial cable.

A. In most cases of this nature, a double steel tape-armored cable will prove entirely satisfactory. This cable can be attached to the messenger strand by the spinner method which gives a neat and serviceable job.

In some cases, also, the cable is protected by covering it with cement-asbestos or fibre conduit. Either method should prove satisfactory in your case.

V V

Nothing is politically right which is morally wrong. — DANIEL O'CONNELL.

The OPERATOR'S CORNER

by MAYME WORKMAN, Traffic Editor

THERE IS so much in life we take for granted—the air we breathe, the sunlight, the magic of pressing a button and flooding a room with light, soaring through the air like a bird while riding on a plane, seeing and hearing people on TV, talking to people thousands of miles away. The wonderful has become the commonplace.

I'm thinking of people who are not able to enjoy all these wonders—the blind, for example. I have known a number of blind men and women and, without exception, they were gallant, courageous people, with a genuine zest for living and a sense of appreciation that many of us fail to possess. They were busy people with no time to feel sorry for themselves. On the contrary, they had a sincere desire to be of help to others.

The blind have a sense of touch, smell and perception that we can never hope to achieve. Their imaginations lend brilliance to their sightlessness which we can never comprehend.

Blind men and women have proved their value in telephone work. An article in the *Chicago Tribune* of May 20 related that two blind women have been working as operators in the Evanston, Ill., exchange of Illinois Bell Telephone Co. for almost a year.

Both use the same type of "cordless B board" as the other operators use, without the aid of special equipment. The two, Miss Natalie Miller and Miss Hildegard Scheff, of Evanston, are the first blind women employed by Illinois Bell, according to the officials of the company.

According to Mildred Avery, chief operator, the blind women handle incoming calls on the adding machine type board and are capable of handling over 500 connections an hour. Miss Scheff has been blind since birth and Miss Miller lost her sight at the age of 6 in an accident. Both have done "excellent jobs," officials said.

The accuracy of both women was described as excellent by J. L. Young, district traffic superintendent. He said, "The girls have come through. I wish we had more such openings."

The program was worked out as an experiment by Mr. Young, with the cooperation of the Hadley School for the Blind and the Illinois division of vocational rehabilitation. Both women move around the office without the use of canes. What an inspiration and challenge these blind women must be to the other employes in the traffic department! It would seem that every operator would have a desire to do a perfect job, seeing what these women, with their physical handicaps, can do.

We all admire a courageous person, one who goes ahead and faces the challenge of life, despite physical handicaps. An outstanding character is Helen Adams Keller, American writer and lecturer, born at Tuscumbia, Ala., in 1880. She was deprived of both sight and hearing by a severe illness at the age of 19 months.

Until she was seven, no serious attempt was made towards her education. She was then placed in charge of Anne Mansfield Sullivan of the Perkins Institute for the Blind, Boston, who came to her home. As a result of Miss Sullivan's teaching, she learned the deaf and dumb language by touch; she also learned to read by the Braille system and to write by using a special typewriter. At the age of 10, under the instruction of Miss Sarah Fuller of the Horace Mann School, New York, she learned to speak.

In 1892, Miss Keller went to Boston, where she since has lived, and, at 16, entered a preparatory school. She was accompanied to all classes by Miss Sullivan, who repeated the lectures and discussions by touch. In 1900, Miss Keller entered Radcliffe College, and, with the continued aid of her devoted teacher, she graduated with honors in 1904. She used textbooks printed in Braille and wrote examinations on her own typewriter. After graduation she became well known as a writer and lecturer on educational possibilities for the blind. Her writings include "The Story of My Life," "Out of the Dark," and "My Religion."

In the life of Helen Adams Keller, we have proof that physical handicaps and adversity have the effect of eliciting talents which, in the unafflicted and the prosperous, may lie forever dormant.

Adversity and affliction are severe instructors, set over us by One who knows us better than we do ourselves, and Who loves us better, too. This conflict with difficulty makes us acquainted with our life's purpose, and compels us to consider it in all its aspects. It will not allow us to be superficial.

Traffic Questions

(1) What is an "Automatic Answering Device?"

(2) When are automatic answering devices in operation?

(3) In advancing a call, if a mechanical answer is received, should the normal verification be omitted?

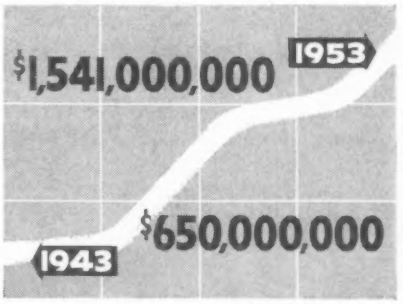
(4) If you do not understand or clearly hear an announcement but it is evident that it was made mechanically, how should you proceed?

(5) Do telephone companies employ blind people or do you know of any such people who have been employed by telephone companies?

Answers are presented on page 36.

On the page at the right is the fifth advertisement of the national campaign of the United States Independent Telephone Association to publicize the Independent telephone industry. The ad will appear in the Sept. 13 issue of *Time*, and the Sept. 24 issue of *U. S. News & World Report*. A similar ad will appear in the *September issue of *Country Gentleman*.

Big enough for leadership...
Never too big for friendship



GROSS PLANT INVESTMENT
of Independent Telephone Companies

The Independent Telephone Industry has grown up with the spirit of friendly community service

It's big... 5,100 Independent Telephone Companies ... more than nine million telephones... serving two-thirds of the entire area of the U.S.! It's a 1½ billion dollar industry today —*double* what it was ten short years ago. Yet, for all its size and scope, it is an industry composed of local companies, managed by local people, serving local needs. And though it is growing larger by the day, it will never outgrow its responsible role in community affairs, its personal concern with the welfare of neighbors and customers. For America's Independent Telephone Industry, no task is too large... no service too small.

USITA

United States Independent Telephone Association

Pennsylvania Bldg. : Washington, D. C.

Maintenance Testing Equipment

By JOHN A. BRACKEN

THE USE OF an ohmmeter in some form or other, has become universal for measuring the electrical resistance of telephone equipment, and for maintenance testing purposes.

There are three general types of ohmmeters, differing mainly in the manner in which the resistance to be measured is connected. They are:

(1) Series type.
(2) Shunt type.
(3) Combination series and shunt type.

The "series" type has the advantage of being suited for measuring medium and very high resistances. The "shunt" type is especially adaptable to measuring very low resistances without drawing excessive current from the meter power supply battery.

In the combination type ohmmeter, the advantages of both the series and

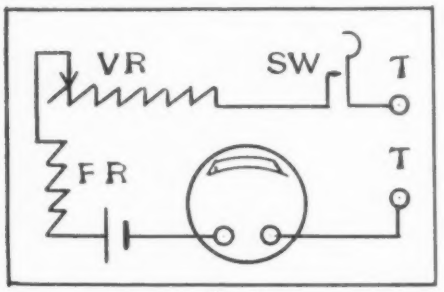


Fig. 1

shunt type instruments are utilized by equipping the meter with suitable resistors and switches so that it may be connected as a series type meter for measuring high resistance, and as a shunt type meter for measuring low resistance, thereby producing a higher degree of accuracy.

The fundamental circuit arrangement of a series type ohmmeter is shown in *Fig. 1*. This is a simple circuit consisting of a dry cell to supply operating power, a switch (SW), a milliammeter, a 500 ohm fixed resistor (FR), a 1,200 ohm variable resistor (VR), and terminal posts (T and T).

The elementary operating principle of the circuit is as follows:

(1) Assume that the dry cell has an EMF of 1.5 volts, the milliammeter a full scale range of 1 milliampere and an internal resistance of 27 ohms.

(2) Suppose a short circuit (zero resistance) is placed between the terminals "T" and "T" *(Fig. 1)*, and the switch SW is closed. This will permit current to flow in the circuit which must be limited to 1 milliampere to obtain full scale deflection of the meter pointer.

PART 72. The preceding article in this series appeared in the May 8 issue on page 22.

In order to limit the current through the meter to 1 milliampere, the variable resistor or rheostat is adjusted until the total circuit resistance is: $R = E \div I$, or $1.5 \div .001 = 1{,}500$ ohms. Of this value, 500 ohms is in the fixed resistor, 27 ohms in the meter and the difference, or $1500 - 527 = 973$ ohms in the rheostat.

Example: If the short circuit is disconnected from terminals "T" and "T," and replaced with an unknown resistance "Rx," and a current flow of 0.3 milliampere is obtained, what is the value of the unknown resistance?

Solution: $Rx = E \div I - R$, or $(1.5 \div .0003 = 5{,}000) - 1{,}500 = 3500$ ohms.

Also, $Rx = R\left(\frac{FS - D}{D}\right)$. Applying this formula to the above example, "Rx" equals resistance being measured; "R" is the total circuit resistance (1,500 ohms); "FS" is meter full scale range (1 milliampere), and "D" the meter scale division to which the pointer deflects (0.3 milliampere). Then

$Rx = \frac{R(FS - D)}{D}$, or

$(.0010 - .0003 = .0007) \times 1{,}500 = 1.05$.
$1.05 \div .0003 = 3{,}500$ ohms.

Fig. 2 illustrates the circuit of a simple shunt type ohmmeter having

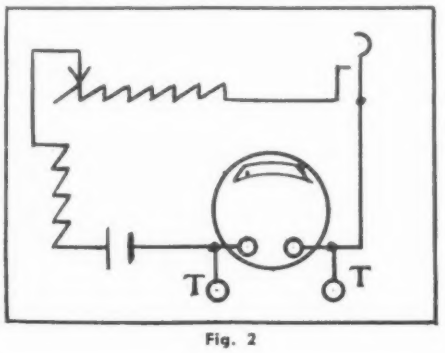


Fig. 2

essentially the same equipment as shown in *Fig. 1*. In this arrangement the resistance being measured is connected in "shunt" with the meter, thus presenting a parallel path for dividing the current, the value in each path varying inversely as the resistance of that path.

The value of an unknown resistance connected to terminals "T" and "T" *(Fig. 2)* may be calculated by means of the formula: $Rx = \frac{Rm}{\left(\frac{FS}{D}\right) - 1}$, where "Rm" equals resistance of the meter moving coil.

Example: An unknown resistance is to be measured: (1) First the terminals "T" and "T" are short-circuited, and the switch closed; then the rheostat is adjusted until the meter pointer deflects to the full scale value of 1 milliampere.

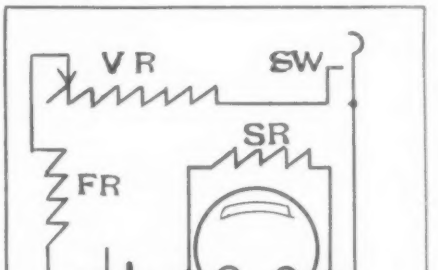


Fig. 3

(2) The short circuit is removed and the unknown resistance is connected to the terminals "T" and "T," and a current flow of say 0.15 milliampere is obtained.

Then the value of the unknown resistance is $Rx = \frac{Rm}{\left(\frac{FS}{D}\right) - 1}$ or, $\frac{27}{\left(\frac{1}{.15}\right) - 1}$

$= \frac{27}{6.6 - 1} = 27 \div 5.6 = 4.8$ ohms.

The low range of the shunt type ohmmeter may be used to measure the value of still lower resistances by permanently shunting the meter unit as shown in *Fig. 3*. The shunt resistor "SR" has a resistance equal to the meter resistance of 27 ohms.

Since both the shunt and meter resistance are equal, the shunt affects the meter range as follows: The meter unit

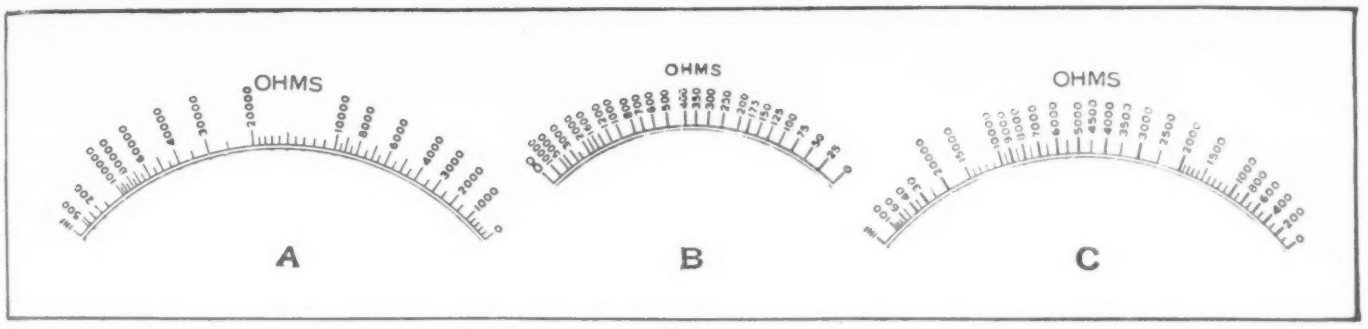


Fig. 4

now has an effective resistance of $27 \div 2 = 13.5$ ohms (SR and Rm in parallel). Under this condition, insofar as any external resistance "Rx" to be measured and connected between the terminals "T" and "T" *(Fig. 3)* is concerned, causes less reduction of the meter reading than would occur with the circuit of *Fig. 2;* that is, the meter is now able to measure much lower resistances than before.

The scale of an ohmmeter is graduated into a number of divisions representing a definite value in ohms as illustrated in *Fig. 4 A, B* and *C*. Minimum or zero ohms is indicated at the extreme right on the meter scale at a point marked "0," and maximum ohms is indicated at the extreme left. The meter is calibrated to read from right to left.

When reading the meter, it will be noticed that the scale is not divided uniformly, but into several major divisions and these in turn, divided into minor sections having their divisions compressed toward the left. That is, moving from right to left across the scale, it will be found that the scale divisions which represent a given number of ohms require less space due to the variation in the current passing through the meter moving coil when resistances of various values are connected to the instrument.

By using different values of EMF and a number of fixed resistors, an ohmmeter can be made to measure practically any amount of resistance. The fixed resistors are whole number multiples of one another, called multiplying factors, usually designated $R \times 1$, $R \times 10$, $R \times 100$, $R \times 1{,}000$ and $R \times 10{,}000$ and are connected into the meter circuit by means of a rotary switch.

In this arrangement, it is only necessary for the meter to have a single scale to indicate the value of the lowest range and then to use the multiplying factors associated with the rotary switch for each of the higher ranges.

Example: If the rotary switch is turned to $R \times 1$, and the meter pointer moves across the scale to a point marked 100, the value of the external resistance is $R \times 1$ or, $100 \times 1 = 100$ ohms. If the switch is set at $R \times 10$, a zero must be added to the reading, that is, $R \times 10$ equals $100 \times 10 = 1000$ ohms. If the switch is set for $R \times 100$, two zeros must be added, for $R \times 1000$, three zeros must be added, etc. This method of reading the ohmmeter scale will apply to any similar type instrument.

In order to become familiar with the idea of multiplying the ohmmeter scale reading by the factor indicated on the range switch, it is good practice when making measurements, to select a very high range, say $R \times 10{,}000$, and then reduce the range until a reading is obtained in the right half of the meter scale, because as the scale divisions on the right are usually farther apart than on the left, it is much easier to read them more accurately. This is especially true when it is necessary to translate fractions of a scale division into ohms.

By means of a microammeter, bridge type copper oxide or similar rectifier, terminal posts, pin jacks, switches, shunts, multiplying resistors and dry cells, a single instrument can be constructed so that changes in the range and scale value of the meter can be so arranged that the instrument will serve as a "multimeter." This is a combination voltmeter, ohmmeter and milliammeter known as a "volt-ohm-milammeter," abbreviated VOM.

This is actually an alternating current voltmeter and milliammeter. It also has a variety of direct current voltage ranges, and a number of direct current milliammeter ranges. At the same time several convenient ohmmeter ranges are available. It thereby meets many electrical measurement and testing requirements.

(To be continued)

V V

Elementary Electricity Quiz

Below are five questions. Underline the word or words in parentheses you consider the right answer to each question.

(1) Is it necessary for electricity to be (static) (in motion) in a telephone circuit in order to carry on a conversation?

(2) The heating of a conductor carrying an electric current is due to (insulation) (amperes) (resistance) (voltage).

(3) An induced EMF is caused by (amperes) (volts) (induction) (ohms).

(4) Two 2-mf capacitators are connected in series. Is their total capacitance (0.5 mf) (1 mf) (2 mf) (4 mf)?

(5) If a piece of wire held in the hand is extended so it points east and west and then dropped to the earth, will an EMF be set up in it (before it is dropped) (while it is falling) (when it strikes the earth)?

See correct answers on page 40.

V V

AT&T Announces Plans for $250,000,000 Bond Issue

Directors of American Telephone & Telegraph Co. on Aug. 18 authorized a new bond issue of 250 million dollars to be offered at competitive bidding. It is expected that the bonds will be dated Sept. 15, 1954, and will mature on Sept. 15, 1984. The trustee will be The Hanover Bank.

The last debt issue of this kind offered by the company was in January, 1950, when a 200 million-dollar issue was sold. Proceeds of the new issue will be used for additions and improvements to Bell System telephone service for the nation.

It is expected that a registration statement will be filed with the Securities & Exchange Commission on Sept. 1 and that bids will be opened on Sept. 21.

V V

Six More Stations Added to Bell TV Network

Bell Telephone System's network television facilities now reach 308 stations in 198 cities in the United States, according to a recent announcement by the Long Lines Department of the company.

New television stations added during August are: WLAC-TV, Nashville, Tenn.; WABI-TV, Bangor, Me.; WGR-TV, Buffalo, N. Y.; WCHS-TV, Charleston, W. Va.; KTAG-TV, Lake Charles, La., and WNAM-TV, Neenah, Wis.

Though each successful company has its own system for promoting P-A-B-X, all agree on one salient point: there's nothing like personal calls to bring in the contracts!

How to get P-A-B-X business

Home Telephone and Telegraph Company
Fort Wayne, Indiana

"Our initial approach is usually a personal call. We follow up this call with a letter outlining the facilities offered by the system recommended, and the letter in turn is followed up by personal calls until the customer reaches a decision.

"In selling P-A-B-X, we stress the flexibility of the equipment, which in many cases is designed to meet the specific needs of a customer. We show the customer the ease with which the equipment can handle his communication problems and can reduce operator hours as compared to an all-manual system. This is a very important consideration today.

"We train all our commercial employees in the operation and use of P-A-B-X systems."

The Home Telephone and Telegraph Company operates 10 offices and 50 P-A-B-X's.

Jamestown Telephone Corporation
Jamestown, New York

"We solicit P-A-B-X orders by personal contact. Our commercial department is always watching for signs that P-A-B-X service is needed: business growth, new building, reports of inadequate service, and those trouble reports where no equipment failure is found" (which indicate that facilities are not faulty, but inadequate).

The Jamestown company studies the prospect's needs and presents a carefully worked-out proposal based on them, in which the advantages of the recommended equipment are noted. Inquiries draw a personal call by a company-trained man, and are then placed on a list for periodic follow-up.

The Jamestown company considers P-A-B-X a good profit item because "extra extensions are used for inter-communication, and line rates are higher." The company operates 12 offices and 33 P-A-B-X's.

Be sure to send for our helpful new sales kit! Packaged in a convenient folder, it contains a meaty sales manual outlining our big P-A-B-X selling plan, a *different* and effective direct-mail folder, general P-A-B-X system catalog, individual systems and service folders, sample survey, proposal, contract, and result-getting sales letters. Ask for the kit, plus *quick delivery* schedules on stock P-A-B-X switchboards.

←

Mr. C. D. Ingebrand, Commercial Mgr., Home Telephone and Telegraph Company, Ft. Wayne, Ind., calls on a potential P-A-B-X customer.

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems

Makers of Telephone, Signaling and Communication Apparatus • Electrical Engineers, Designers and Consultants

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1033 West Van Buren Street, Chicago 7, U. S. A.

REA Allocates $2,253,000 in Loans to Eight Companies

Loans for improving and extending rural telephone service in South Carolina, Illinois, Kansas, Georgia, Louisiana, Oklahoma and Iowa were approved by Rural Electrification Administration (REA), the U. S. Department of Agriculture announced on Aug. 25. Details of the loans which amounted to $2,253,000 follow:

Chesnee (S. C.) Telephone Co.; on Aug. 11, an allocation of $210,000 to improve and extend rural telephone service in Cherokee and Spartanburg counties.

The Chesnee company is now furnishing dial service to 375 subscribers over 62 miles of line. The loan funds will be used to provide additional central office equipment, to construct approximately 100 miles of new line, and install facilities to serve 400 rural families in the service area now without telephones.

The completed system will consist of 157 miles of line. H. W. Askins is president of the Chesnee company.

* * *

A loan allocation of $242,000 to the Alhambra-Grantfork Telephone Co., Alhambra, Ill., on Aug. 13, for the improvement and expansion of telephone service in rural sections of Madison and Bond counties.

The borrower plans to build new dial facilities to provide improved service to 424 existing subscribers and to add 148 new subscribers. The proposed system will consist of two exchanges with automatic dial central offices located in the villages of Alhambra and Grantfork and will continue to provide service in them as well as in adjacent rural areas. There will be extended area service between the Alhambra and Grantfork exchanges.

When completed, the new system will consist of 150 miles of pole line, of which 144 miles will be new or rebuilt line.

Subject to approval of the Illinois Commerce Commission, the Alhambra-Grantfork Telephone Co. will be a commercial organization formed by the merger of two stock mutuals. These are the Alhambra Mutual Telephone Co. and the Grantfork Mutual Telephone Co. E. H. Isenberg is the chairman of the interim organization of the Alhambra-Grantfork company.

* * *

The Harper County Rural Telephone Association, Inc., Anthony, Kan.: on Aug. 16, $363,000 to finance the improvement and extension of rural telephone service in Sumner and Harper counties, Kan., and a small portion of Alfalfa county, Okla.

With the loan funds and funds of its own, the new borrower proposes to construct a modern telephone system to serve approximately 800 subscribers in its service area. As a nucleus for the new system, the association plans to acquire properties of the Corbin (Kan.) Telephone Exchange, the Perth (Kan.) Telephone Co., and a portion of the properties of the Farmers Mutual Telephone Co., South Haven, Kan.

It will also acquire access rights to the operating areas of Farmers Mutual and the Freeport (Kan.) Telephone Exchange and the Waldron (Kan.) Telephone Exchange. The properties to be acquired now furnish magneto service to 486 subscribers, including 193 switchers over 244 miles of line. The switchers, all on farmer-owned lines, are planning to voluntarily dismantle their facilities and become regular subscribers of the new borrower as soon as service is available.

The Harper county association plans to rebuild 208 miles of the existing line, construct 89 miles of new line, and install new dial central office facilities at Corbin, Freeport, South Haven and Waldron. These changes and improvements will make it possible for the Harper County organization to serve 304 subscribers in its service area now without telephones.

The completed system will consist of 305 miles of line. Dean Hughes is president of the Harper County association.

* * *

Ellijay (Ga.) Telephone Co.: also on Aug. 16, $224,000 to finance the improvement and extension of rural telephone service in Gilmer County.

The borrower is now serving 402 subscribers. With the REA loan, he plans to convert the system to dial operation, add 82 miles of new line and other facilities to provide modern service to 273 rural families now without telephones. New construction will include a dial central office building at Ellijay.

The completed system will consist of 107 miles of line. S. B. Green is president and manager of the Ellijay company.

* * *

East Ascension Telephone Co., Gonzales, La.: on Aug. 16, $286,000, fourth loan to this company.

The borrower plans to use these loan funds to expand the present service area into adjacent Livingston Parish to serve 600 families now without telephones. New dial offices will be constructed at Maurepas and French Settlements, and approximately 100 miles of new line will be added to the system.

The four loans totaling $876,000, will make it possible for the East Ascension company to serve 2,097 subscribers in Ascension and Livingston parishes.

Funds made available in prior loans provide service in and around Gonzales in Ascension Parish. This portion of the system has been cut over to dial operation and more than 1,100 subscribers are now receiving dial service there. Mrs. Anona Baker is president of the East Ascension company.

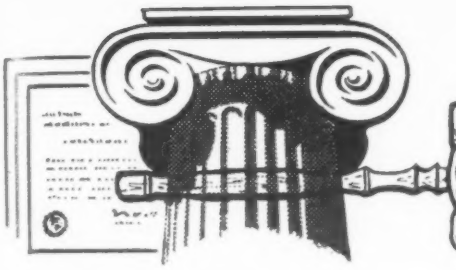
* * *

Cross Telephone Co., Warner, Okla.: on Aug. 17, $226,000 to finance the improvement and extension of rural telephone service in Muskogee, McIntosh and Sequoyah counties.

The borrower is now serving 256 subscribers over 53 miles of line from magneto central offices in Warner and Webbers Falls. REA loan funds will permit the company to install three unattended dial offices at Warner, Webbers Falls and Gore; to rebuild 28 miles of the existing pole line; and to construct 117 miles of new line.

The rehabilitated system will provide service for 269 new subscribers now without telephones. The completed system will have 163 miles of line for the 525 subscribers. E. K. Cross is president and manager of the Cross company.

(Please turn to page 36)



Courts and Commissions

OK Rate Raises in California To Balance Federal Tax Rise

The California Public Utilities Commission on Aug. 17 authorized the Pacific Telephone & Telegraph Co. to increase its rates enough to produce an additional $7,071,000 a year (TELEPHONY, Aug. 21, p. 26).

The increase is in addition to the general increase amounting to 11 million dollars a year recently granted the company. It is to compensate the company for its higher federal tax bill under the new tax law signed on Aug. 16 by President Eisenhower.

Specifically, the rate increases were designed to restore the expense allowances for federal income taxes to the current 52 per cent level from the 47 per cent rate that was contemplated when present rates were approved. No increase in net income will result, the commission said.

Basic monthly rates for subscribers will not be raised, Commission President Peter Mitchell said. Instead the company got permission to increase its charges for installing and maintaining PBX switchboards and its intrastate toll charges.

Another California company which won similiar commission authorization to raise rates because of the new tax bill, was the Los Gatos Telephone Co. —a total of $2,575 at its Novato exchange.

V V

Central Telephone Asks W. Va. Commission for Rate Raise

Central Telephone Co., Charlottesville, Va., recently filed an application to the West Virginia Public Service Commission for adjusted rates for all its exchanges in West Virginia.

The last request for an increase was filed in March, 1948. Continued rising costs of providing an ever-increasing amount of service make this adjustment necessary, Mr. J. B. Compton, district manager, said. "The principal items which affect costs are continuing higher wage levels incident to operation, and the much higher investment in telephone plant required under today's conditions to serve any given number of telephones. . . . The continued demand for expansion of plant in the communities requires large amounts of additional investment money. A record of good earnings is necessary to attract this money. Adequate rates are essential to good earnings."

V V

Petitions for Stock Issue OK In North Carolina

The Durham Telephone Co. applied to the North Carolina Utilities Commission on Aug. 16 for permission to sell 10,000 shares of no par value common stock at $50 a share and 16,000 shares of 6 per cent cumulative preferred stock at $25 per share.

Proceeds from the common stock would be used to retire 6,450 shares of 5 per cent cumulative preferred stock. The new 6 per cent preferred stock would be sold after the 5 per cent stock is recovered, and income from the sale of the new preferred stock then would go with any funds left from the common stock sale to provide funds for expanding and improving the company's facilities at Durham and Creedmoor.

V V

Indiana Company Authorized to Issue $105,000 First Mortgage

The Knightstown Telephone Co. was authorized to issue $105,000 worth of first mortgage notes July 30 by the Indiana Public Service Commission.

The money is to be used to retire debts, install automatic equipment at Wilkinson, Ind., install additional automatic equipment at Knightstown and to rehabilitate its lines.

V V

Missouri Commission Acts on Telephone Company Requests

Grand River Mutual Telephone Co., Princeton, asked the Missouri Public Service Commission for authority on Aug. 24 to add three more northern Missouri exchanges to its territory.

The commission was asked to let Grand River purchase the Chula Telephone Co., the Eagleville Switchboard Co. and the Martinsville exchange of the Terry Telephone Co.

Grand River also is planning to purchase the Ravanna (Mo.) Telephone Co., but said it would not need commission approval of the purchase since the cooperative is not regulated by the commission.

In other cases, the Missouri commission:

Granted the Purdy Telephone Co. authority to issue to its stockholders 600 shares of common stock and to sell 400 shares of preferred stock at not less than $50 a share. Revenue from the preferred stock sale would be used to modernize its service.

Gave Southwestern Bell Telephone Co. the right to buy the Rogersville Telephone Co. The present owners said the Rogersville area is being built up faster than they can afford to expand their telephone system.

Received the application of V. F. and Georgia Garoutte to sell and Roy and Violet Eppard to purchase the Goodman Telephone Co.

V V

Washington Independent Asks Second Rate Raise Since 1920's

Arthur Garrett of Quilcene, president of Community Utilities, Inc., which owns and operates the Jefferson County Telephone System, Inc., announced recently that an application has been filed with the Washington Public Service Commission for rate increases for 335 rural subscribers.

Mr. Garrett said an increase would be only the second since the 1920's.

"We have made an earnest effort to keep our rates down, but the cost of materials and labor have made it impossible for us to operate satisfactorily without an increase," Mr. Garrett said. "We simply are unable to make any extensions and improvements at the present level of earnings, which was less than one per cent for the first six months of this year."

V V

Applies for Rate Increases For Oregon Exchanges

Due to increased operating costs and investment requirements, application for increased rates was filed on Aug. 5 with the Public Utilities Commissioner of Oregon by the West Coast Telephone Co., Everett, Wash.

"We have faced a staggering task to keep up with the rapid growth of the

Pacific Northwest areas we serve," said Ray Dalton, vice president and general manager of the West Coast company. "To make more telephones available for more people, and to take advantage of technical improvements such as dial equipment, we have had to invest tremendous sums of money.

"Our goal is now, as it has always been in the past, to bring the best possible telephone service at the lowest possible cost," Mr. Dalton stated. "But in spite of the time and labor-saving equipment we have installed, our costs continue to go up. . . .

"In order to continue improving and expanding telephone service, it is urgently necessary that we maintain at least an adequate level of financial stability. Otherwise we could not obtain the money necessary to continue this service expansion and improvement as we have for the past few years.

"Typical increases for residence services are less than two cents per day," Mr. Dalton said.

Four-party residence rates in Enterprise and Sandy would change from $3.00 to $3.50; and in La Grande, Gresham and Hillsboro from $3.25 to $3.70. Rates for one-party business service would change from $6.75 to $7.75 in Enterprise and Sandy; and in La Grande, Gresham and Hillsboro, from $8.75 to $9.75.

"During this expansion period," continued Mr. Dalton, "our total income has also increased, but not in proportion to our increased costs. . . . By providing more telephones for more people and by improving the quality of telephone service, our subscribers are getting more for their money now than at any time in the past."

V V

Pennsylvania Commission OK's Purchase of Independent

The North Pittsburgh Telephone Co., Gibsonia, on Aug. 4 gained Pennsylvania Public Utility Commission authority to buy the Freeport Telephone Co. (TELEPHONY, May 22, p. 36).

North Pittsburgh will take over Freeport in a stock transaction as the first step toward merging with that company and the Saxonburg Telephone Co., it was reported.

V V

Southern Bell to File New Rate Plea in Tennessee

Plans of Southern Bell Telephone & Telegraph Co. to file a new rate increase petition with the Tennessee Railroad & Public Utilities Commission were revealed on Aug. 23 by Sam Youngblood, the company's Tennessee general manager (TELEPHONY, Mar. 20, p. 28).

Although declining to predict the amount that would be requested, Mr. Youngblood said an earlier request for $7,300,000 is now "out of date and, in the light of increased operating costs and higher investment costs, does not accurately reflect the company's current need for additional revenue."

Announcement that the company would file a new petition with the commission was made simultaneously with the disclosure by the utility that it would not appeal its two-year-old case to the Tennessee Supreme Court.

"The pending case," Mr. Youngblood said, "is based on operating results prevailing in the 12-month period from July 1, 1951, to June 30, 1952. Since that time, telephone earnings have dropped still lower.

"This decline was caused by two general wage increases, the construction of great amounts of costly facilities required to meet public demand for service and other substantial expenses. The combination of increased costs has rendered completely unrealistic the basis on which present Tennessee rates were formulated.

Mr. Youngblood said it would probably be several weeks before the company filed its new petition with the commission.

The company filed its first request with the Tennessee commission on Aug. 15, 1952. It sought an increase in intrastate rates that would raise annual earnings by $5,034,361. This was subsequently amended to ask for rates to provide a $7,300,000 annual increase.

That request was denied by the commission on July 14, 1953. The commission contended at that time that existing rates were ample to cover the firm's intrastate requirements. The commission said the company "by its own admission" was getting a return of 4.96 per cent under the existing rates.

Southern Bell appealed to Davidson County Chancery Court and Chancellor William J. Wade ruled against it last Mar. 5. The company obtained permission to appeal to the state supreme court but did not go through with the appeal.

Mr. Youngblood said one of the reasons for deciding to file a new petition with the commission was that no decision on an appeal to the state supreme court could be expected for many months and even if favorable to the company "could result only in further proceedings before the commission at that time."

"This same result," he noted, "can be reached and with far more promptness, by foregoing the appeal and going at once to the commission."

Oregon Independent Gains Increased Rate Schedule

Oregon Public Utilities Commissioner Charles H. Heltzel on Aug. 25 approved a $1,520 increase in rates for the Glendale Telephone Co. (TELEPHONY, Aug. 28, p. 36). The company had filed a revised rate schedule which would have provided an additional $3,020.

The commissioner found that as of June 30, the average net utility plant in service less depreciation reserve plus working capital was $56,535. However, this figure will be materially increased at the time of dial conversion scheduled for Sept. 18.

The ultimate expenditure to improve the service and convert to dial operation will represent a plant investment of approximately $100,000. Based on an equity of approximately 20 per cent of the total investment, an interest rate of 5½ per cent should receive recognition, the commissioner stated.

It was decided by the commissioner that the increase allowed would provide a reasonable rate of return on its rate base in service as of June 30.

V V

Cameron (Tex.) City Council Grants Rate Raise to SW Bell

A rate increase recently was granted the Southwestern Bell Telephone Co. by the Cameron (Tex.) City Council.

The rate increases granted are as follows:

	Old	*New*
One-party business	$7.50	$8.50
One-party residence	3.75	4.75
Two-party residence	3.25	3.75
Four-party residence	2.75	3.25

V V

Tennessee Independent Requests Increase in Rates

A request for a rate increase by the Millington Telephone Co. was taken under advisement on Aug. 25 by the Tennessee Railroad & Public Utilities Commission after a hearing in which spokesmen for the company said it was losing money under existing rates.

Lon MacFarland, attorney for the company, said expenses increased as a result of a $1,116,000 expansion program which includes changing to a dial system. The change is scheduled on Oct. 20.

The company seeks a sufficient increase to give it a 3 per cent return on its investment.

The rate increase, if granted, would be the first since 1928.

New rates for business service would change as follows:

One-party, from $3.00 to $7.00; two

party (presently none) $6.00; four-party, $3.00 to $5.00, and multi-party, $3.00 to $4.25.

Residence rates would change as follows:

One-party, $2.50 to $5.25; two-party (none now) $4.35; four-party, $2.25 to $3.50, and multi-party, $3.00 to $3.50.

V V

Washington Independent Applies For Rate Raise

Darrell Coffey, manager of the Kalama Local Telephone Exchange, announced on Aug. 18 that the company has applied to the Washington Public Service Commission for a general increase in telephone rates.

Under the proposed rates charges would run from $6.00 for one-party business and $4.75 for one-party residence service, to $4.75 for 10-party business and $3.50 for 10-party residence telephones.

Rural rates where lines are owned and maintained by the subscribers, would be raised from $1.00 to $1.50. Also, Mr. Coffey is requesting the right to raise pay telephone calls from five to 10 cents.

The company is spending $50,000 in a modernization program which will include a change to automatic equipment.

V V

Nebraska Independent Asks Permission to Raise Rates

The Indianola Telephone Co. recently asked the Nebraska Railway Commission for authority to increase rates for local telephone service.

The application was to have been informally presented to the commission on Aug. 19.

V V

Wis. Companies Seek Raises

The Wisconsin Public Service Commission recently was to have heard the following applications for rate raises from two Independent companies: River Valley Mutual Telephone Co., on Aug. 25, and the Mt. Vernon (Wis.) Telephone Co. on Aug. 26.

V V

N. D. Independent Buys Another

Reservation Mutual Aid Telephone Corp. of Parshall, N. D., purchased the Queen City Telephone Co., Ryder, N. D., recently, it was reported.

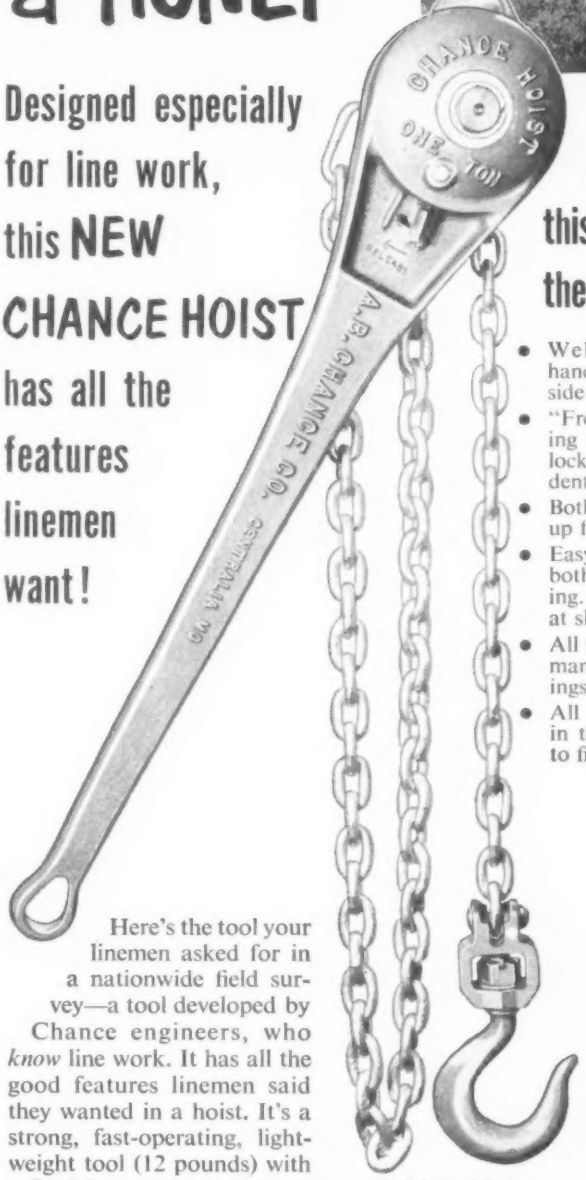
V V

Kansas Company Incorporates

The Colwich Telephone Co., Inc., has been incorporated in Bentley, Kan., *Kansas Business Magazine* reported in August. Incorporators are Herold and Inez Osborn, both of Bentley, and Orville Osburn, of Colwich.

Linemen call this hoist a "HONEY"

Designed especially for line work, this NEW CHANCE HOIST has all the features linemen want!



Here's what makes this ONE-TON HOIST the linemen's favorite:

- Well-balanced, easy-to-grip handle that operates from either side to avoid obstructions.
- "Free-wheeling" for ease in hooking to load, with an automatic locking control to prevent accidental dropping of load.
- Both half link and full link take-up for accuracy and speed.
- Easy working swivel hooks on both the chain and the hoist housing. Safety latch hooks, if desired, at slight additional cost.
- All working joints fitted with permanently lubricated oilite bearings.
- All working parts fully enclosed in the housing to prevent injury to fingers.

Here's the tool your linemen asked for in a nationwide field survey—a tool developed by Chance engineers, who *know* line work. It has all the good features linemen said they wanted in a hoist. It's a strong, fast-operating, lightweight tool (12 pounds) with a flexible steel load chain that won't kink, bind or uncouple. Controls can be worked without removing gloves. It's rated to lift a one-ton load and it's tested to 3000 pounds. Give your lineman the extra help and safety that the Chance Hoist can provide.

CT54-9

A·B·CHANCE CO·

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

IN THE NATION'S CAPITAL

Concluded from page 18

amount includes loans made from appropriated funds.

The question might arise as to why the comptroller general's audit is so far behind in view of the fact that it covers only the end of the fiscal year 1952—whereas fiscal 1954 was ended last July 1. The exhaustive nature of this report, and the fact that it covers an analysis of obligations which must drag on past the date of execution explain why this two-year-old audit was only sent to the Congress late in July of this year, and recently released.

For this reason the comments made by the GAO audit on rural telephone loans are not particularly enlightening at this late date. There is this interesting commentary on rural telephone loan policies, however:

"REA expects the rural telephone loan program to expand substantially in subsequent years, since only about 40 per cent of the farms in the United States now have telephones (38.3 per cent according to the Census of Agriculture for 1950). . . .

"In accordance with the act, REA does not approve loans for retiring existing indebtedness merely to permit borrowers to refinance at lower interest rates or on longer amortization terms. Also, the administration prohibits loans intended solely for merging or consolidating existing telephone systems.

"Loans for these purposes are approved only when REA considers them necessary to improve or extend telephone services in rural areas. REA has not exceeded the limitation in the act, which provides that amounts for refinancing shall not constitute more than 40 per cent of any telephone loan."

CARRIER SYSTEMS

Concluded from page 21

very long, may interfere with the operation of the system, in which case the central office terminal may actually have to be mounted on a pole at the end of the cable, rather than in the central office building.

* * *

The foregoing material describes the general operating principles of most of the common types of carrier used today. Because it covers a number of different types of systems, made by different manufacturers, it has not been possible to give specific information at various points. Rather the attempt has been to provide general information which would apply to many systems, in order to give the reader a good basic knowledge of the subject.

Each of the manufacturers can supply excellent material on their systems, complete with block diagrams, photographs, frequency ranges, etc. In addition, these manufacturers are prepared to offer assistance and advice to those who are in the market for carrier systems, and can recommend a specific type of carrier when they have been told of the problem.

Much has been left out of this series of articles, because the effort has been to include only that material which would be closest to the needs of Independent telephone companies. For instance, there are the coaxial cable carrier systems, which carry hundreds of conversations as well as television programs. A recent development, not yet in manufacture is a subscriber line carrier which will use transistors instead of vacuum tubes. This will make a carrier unit which will be very small in size, and which will operate from dry batteries at its remote terminals.

Because carrier maintenance problems might be an item of major concern to companies with a limited number of personnel, future articles in this series will detail trouble shooting methods in carrier equipment.

Order Reprints Now

Reprints of the completed series on "Carrier Systems" will be available following its publication in TELEPHONY (last installment to appear in the Sept. 18 issue), *providing sufficient orders are received to justify reprinting.* Companies desiring reprints for their employes are asked to inform TELEPHONY the quantity they will need as early as possible.

V V

Refusal to Yield Party Line Causes Fire Loss in Minn.

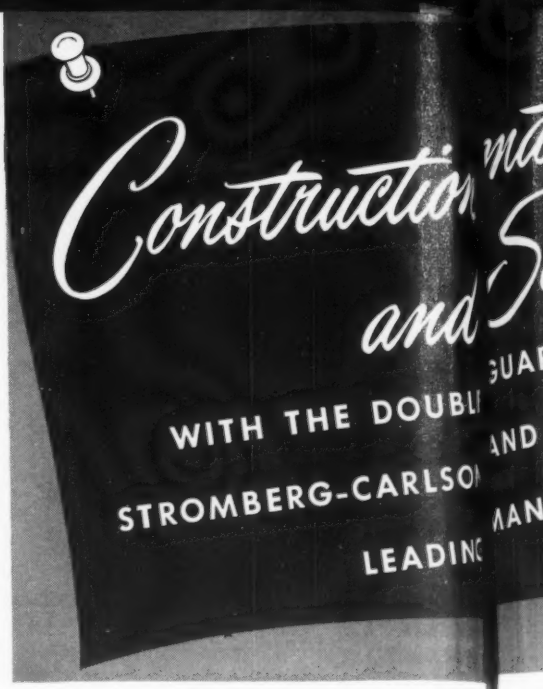
A Minnesota woman blamed others on her party line for the loss of her farm home in a fire which occurred Aug. 19.

She said the telephone line was in use when she tried to call the fire department, and when she tried to break in someone told her:

"Lady, you'll have to try another angle. You'll have to wait your turn."

Finally she put her three small children into the car and drove four miles to a Duluth fire station. That station couldn't answer out-of-city alarms, and called the Rice Lake volunteer department.

By the time firemen arrived, the house was destroyed.



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• Higher sustained voltage • Longer life • Rock-bottom economy.

These qualities, more important now than ever before, are assured through the constant supervision of America's largest dry battery laboratory.

Made by the makers of "Eveready," "Air Cell" Operators' Transmitter Batteries.

The quality cell preferred by telephone engineers

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RAYTHEON RectiChargeR*

maintains constant voltage output over the complete load range!

Maintains the close voltage limits required by telephone systems and reduces such common difficulties as incorrect ringing, line noises and lamp failures. The constant potential method of charging prevents battery gassing and water loss. A smaller maintenance crew can handle a greater number of installations.

A small storage battery floated across the terminals of a Raytheon RectiChargeR for emergency and peak period use is kept at constant cell voltage so that it never becomes overcharged or undercharged . . . thus prolonging the life of the battery.

The frequent use of the Raytheon RectiChargeR in unattended exchanges is ample proof of its dependability. Available from 1.0 to 100.0 amperes with either 24 or 48 volt output.

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revenue-saving
in long-lasting poles
is yours when you use

DIAMOND C POLES

Now better than ever, as made in Colfax Lumber & Creosoting Co.'s NEW plant

All Diamond C poles are carefully selected from trees growing in the heart of the famous Southern Yellow Pine belt. Each pole is graded according to physical properties desired and pressure-treated with 8 lbs. (more, if you want it!) of grade No. 1 creosote oil, per cubic foot of wood. A new and modern treating plant promises better-than-ever quality and faster deliveries.

Have the lowest possible annual pole cost. Specify . . .

DIAMOND C

COLFAX LUMBER & CREOSOTING COMPANY, INC.

The illustration above shows unit with cover removed.

the new

cook party line junction

(PROTECTED)

Here's an ideal unit for terminating and protecting the cable pair drop, the cable pair, and distributing four party line drops.

Circuit consists of ground stud, a pair of true gap lightning arresters, cable drop studs and heavy busses each equipped with four screw type terminals. Easy to install. All drop wires are doubly protected when used in conjunction with Cook substation protectors.

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"Panoramic Vision" Television Receivers

AND MANY OTHER ELECTRONIC PRODUCTS FOR OUR ARMED FORCES

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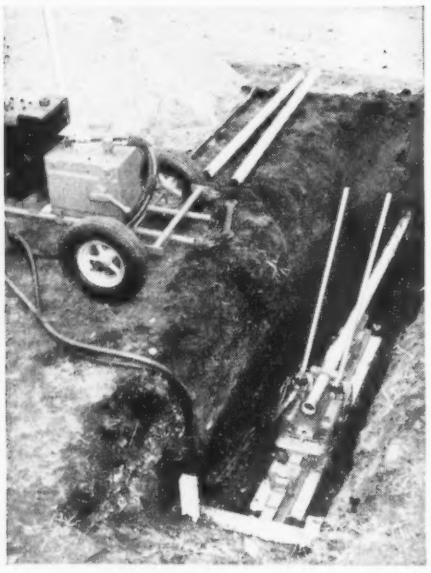

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Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.

TOOLS FOR CRAFTSMEN

GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2064 Columbia Avenue, Rockford, Illinois, U.S.A.

REA ALLOCATES

Concluded from page 30

Farmers Mutual Cooperative Telephone Co. of Shelby County, Harlan, Iowa; on Aug. 20, $295,000, to improve and extend rural telephone service in Shelby County.

The borrower is presently furnishing common battery and magneto service to 1,157 subscribers over 239 miles of line.

With the REA loan, the Shelby County cooperative plans to rebuild 196 miles of the existing line, convert the Irwin, Kirkman and Jacksonville central offices to dial operation, and retain the common battery central office at Harlan. About 7 miles of new line will be constructed. These changes and improvements will make it possible for the borrower to offer new and improved service to 1,207 subscribers.

Service without toll charge will be available between the Harlan common battery office and each of the three dial offices.

The completed system will consist of 265 miles of line. Jay C. Colburn is president and Ed Hons is manager of the Farmers Mutual company.

* * *

North Central Telephone Co., Clare, Iowa; also on Aug. 20, $407,000 to finance the improvement and extension of rural telephone service in Hamilton, Humboldt, Pocahontas, Webster and Wright counties.

The North Central company is now furnishing magneto service to 906 subscribers through central offices at Clare, Duncombe, Thor and Vincent. With the REA loan, the borrower proposes to convert the system to dial operation, rebuild 296 miles of the existing line and add 17 miles of line. These improvements and changes will enable the company to furnish improved service to the existing subscribers and initial service to 180 rural families in the service area.

The completed system, operating through four dial central offices, will serve a total of 1,086 subscribers over 348 miles of line. Lee Haverkamp is president and R. J. Gunning is manager of the North Central company.

V V

General Manager Becomes Head Of Ohio Independent

C. A. Beswick, a veteran Ohio Independent telephone executive, was named president of the Geneva (O.) Telephone Co. at a special meeting of its directors recently. He succeeds A. A. Searle, who resigned.

Mr. Beswick will continue as general manager of the company, a post he has held since 1939. He started with the company 29 years ago. He began as a ground man and has served as wire chief, secretary and general manager.

Other changes announced by the company are: John T. Jones, vice president, was named treasurer; Bonnie Markham was elected secretary, and Robert A. Beswick became assistant manager.

Answers to Traffic Questions On Page 24

(1) Certain telephones are equipped with an automatic device, known as an Automatic Answering Set, which answers the telephone when a ring is received and then makes a recorded announcement, the wording of which is at the discretion of the called customer. There are two types of such sets used. One is equipped for answering the called telephone and making a recorded announcement only, and one is equipped for answering the called telephone, making a recorded announcement, and recording a message from the calling party. A set equipped with the message recording feature will be so indicated in the announcement. In this type of set the period for recording a message, which may be specified in the announcement, will normally be 30 seconds and will be indicated at the beginning and end by a tone signal.

(2) Such devices are usually in operation at a called telephone during periods when the premises are unoccupied or, in any case, when no person is available to answer.

(3) Yes, and also omit an announcement and be guided thereafter by the wording of the recorded announcement.

(4) Wait until it is evident that the announcement interval, or message recording interval when provided, has ended, then clear the connection, again reach the called telephone as on a new call, and listen carefully for the recorded announcement.

(5) Blind people have been employed by telephone companies, in some instances as switchboard operators. For further information on this subject, refer to the preface to the questions and answers.

"PLEASE HELP ME. MY HUSBAND IS VERY ILL."

Out of the Night Came a Call for Help

Quick action of alert telephone operator helps save man with heart attack

AWARDED VAIL MEDAL. Mrs. Carolyn F. Gross, night operator in Berlin, N. J. Awarded Vail Medal for "initiative and resourcefulness" in answering an emergency call. Vail Medals, accompanied by cash awards, are given annually by the Bell System for acts of noteworthy public service by telephone employees throughout the country.

It was about two o'clock of an August morning when the call flashed on the switchboard. A woman, in an excited voice, asked to be connected with a doctor.

Mrs. Carolyn F. Gross, the night operator, rang the doctor's home immediately but he was unavailable. Sensing a critical emergency, she asked if she could be of help in getting another doctor.

"Oh, please do everything you can," implored the caller. "My husband has had a heart attack and is very ill."

Mrs. Gross rang a doctor who had helped in a previous emergency. Then, realizing he was new in the area, she arranged to have the State Police meet him at a certain point and lead him to the house.

Shortly after, the subscriber's daughter called to ask for oxygen.

"It's on the way," said Mrs. Gross. "I thought you might need it so I telephoned the emergency ambulance service. They ought to be there any minute."

Just before she went off duty, Mrs. Gross called to ask how the sick man was doing and if there was anything else she could do.

"You've already done so much," said a grateful voice. "The doctor says that it's only because of your help that my husband is alive."

POLICE ESCORT. To help the doctor get there faster, the operator arranged for the State Police to escort him to the sick man's home.

EVER READY . . . EVER HELPFUL. *Day or night, rain or shine, the telephone stands ready to help you—in the everyday affairs of life as well as emergencies. This swift, willing worker will run your errands, guard your home, save countless steps and valuable time and keep you in touch with relatives and friends. In office and home, these oft-repeated words reveal its value—"I don't know what I'd do without the telephone."* **BELL TELEPHONE SYSTEM**

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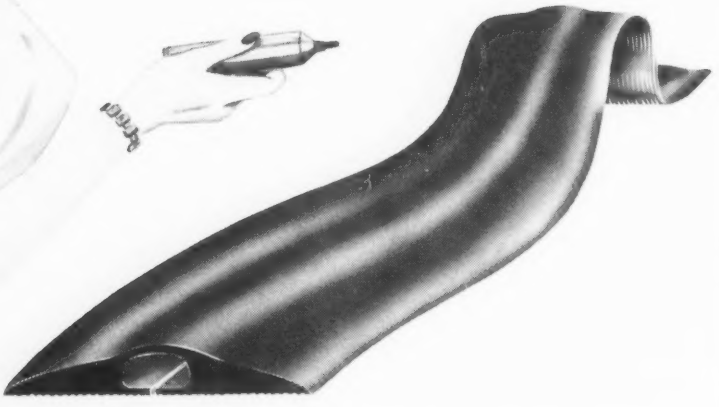

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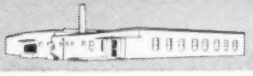
1250 KINNEAR RD.  COLUMBUS 21, OHIO

Ohio Companies' Plans to Improve Service Featured

The growing pains and modernization problems of Independent companies all over the country are much the same as those summarized in an article written recently by Mardo Williams in the Columbus (O.) *Dispatch* on the Ohio Independent companies. He wrote:

"Many of Ohio's 169 Independent telephone companies, with lines sprawling across more than 72 per cent of the state's area, face two serious problems in the coming months.

"On the one hand, they must bring their telephone service up to new minimum standards under the Henderson law (TELEPHONY, Aug. 21, p. 26). On the other, they must find new investors, obtain capital for financing needed improvements.

"The two problems actually are one. Without added funds, officials explain, affected companies will be unable to meet such demands as quicker completion of calls, less interruption, and 24-hour daily service.

"But the Independents have been doing something about their dilemma, even prior to the new law and an Ohio Public Utilities Commission ruling placing it in effect Jan. 1, 1955.

"In the seven years after World War II they spent 125 million dollars on new plants and equipment, are spending 18 million dollars more this year. Exchanges are being shifted to automatic equipment, 26,000 new phones will be added this year, and all-around service is being improved.

"There still remain hundreds of the old magneto-type, hand-cranked telephones scattered in rural sections of Ohio. But they are becoming more and more of an oddity. Within three years, leaders predict, practically all will be replaced by modern equipment.

"A few Independents like those at Mansfield, Lorain, Newark, Elyria, Chillicothe, Ashtabula, Troy and Kenton operate primarily in cities and have been practically 100 per cent automatic for years.

"But others have subscribers scattered throughout rural areas where maintenance and repairs are very costly. Conversion to automatic equipment while improving general service has been a problem with these firms. One even halted payment of all dividends to speed the change-over.

"Statewide, the Independents report that 27.5 per cent of their subscribers are in rural areas. This compares with Ohio Bell Telephone Co.'s rate of 4.8 per cent, and Cincinnati & Suburban Bell Telephone Co.'s rate of 3 per cent.

"The distance between homes, the necessity of having poles and lines above ground where they are subject to

Answers to Questions On Page 27

(1) In motion.
(2) Resistance.
(3) Induction.
(4) 1 mf.
(5) While falling.

wind and ice damage, and the miles of line between outlying homes and the exchange contribute to the problem.

"Also, rates have remained almost stationary for many firms while costs of replacing poles, lines and other equipment have doubled and tripled. Labor costs, too, are up and now take almost one-half of every dollar received for telephone service.

"Five of the leading Ohio Independents pointed up the need of financing this year when they went before the utilities commission and obtained permission to issue stock for improvements and expansion.

"They are the Northern Ohio Telephone Co., Bellevue, servicing 84,600 telephones; Ohio Consolidated Telephone Co., Portsmouth, 49,655 telephones; Loraine Telephone Co., 29,451 telephones; Commonwealth Telephone Co. of Ohio, Athens, 12,295 telephones; and Western Reserve Telephone Co., Hudson, 6,977 telephones.

"These five are among the 20 biggest Ohio Independents. The largest is General Telephone Co. of Ohio, Marion, with 93,941 telephones. Other telephone companies operating in the state include the giant Ohio Bell and the Cincinnati & Suburban Bell.

"Industrial decentralization also has placed new demands on the telephone companies. As one result, General Telephone and Ohio Consolidated started ambitious improvement programs in the area surrounding the Pike County atomic plant.

"Ohio Consolidated even announced its Portsmouth operations will be fully automatic by 1956 with a modern building to be erected for its new automatic switching equipment.

"Other Independents have been improving equipment and service. Recently, exchanges at Carey, (Wyandot County), Bradford (Darke County) and Flushing (Paulding County) were shifted to dial equipment. Throughout the state, the 169 firms expect to convert 77,505 telephones to automatic this year.

"Ohio Independents service 654,940 telephones through 601 exchanges and pay their 7096 employes a total of $17,430,000 yearly."

V V

Improvises Reception of World Heavyweight Title Fight

Stephen G. Martin, of Denver, Colo., recently sent TELEPHONY the following account of how he succeeded in overcoming an inopportune radio blackout in his home. He wrote:

"During the recent Marciano-Charles heavyweight title fracas, which was not televised in this area, our radio went kaput! Our 16-year-old male offspring, who was at the time confined to the house with a broken leg, cast one appealing glance my way and then subsided with a look of tragic resignation on his face. His reluctant acceptance of this cruel whim of fate was prompted, I knew, by my own inadequateness to meet the situation.

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. . . with Fisher-Pierce Photoelectronic Light Switches that work automatically at dusk

Glo-Domes automatically "light up" at dusk — or whenever daylight falls below a definite level, regardless of the time of day, season or weather — and turn off at dawn, when equipped with Fisher-Pierce #6502 controls. They *never* need manual resetting should power failures occur. Exceptionally low in cost, the F-P unit employs a phototube and quality components selected for long life and *dependable* service. Installation of the self-contained control is simple and rapid. You'll get maximum economy and dependability by specifying the Fisher-Pierce #6502 Control when ordering Glo-Dome conversion kits.

Fisher-Pierce Controls are leaders in their field

The #6502 Control, for use with *any* outdoor telephone booth, is one of several types manufactured by Fisher-Pierce for *automatic* lighting control. Fisher-Pierce photoelectric industrial and street lighting controls have been the predominant choice for nearly a decade.

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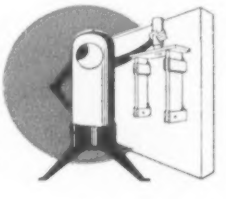

You see, I am a wheel-chair jockey, having recently lost both legs.

"My wife had gone out for the evening. My daughter was at summer camp with—of all things—our portable radio! The two remaining members of the family both had restricted mobility. What to do?

"After a few moments of squirrel-cage mental processes, an answer flashed into my rattled brain. Rolling to the telephone I feverishly dialed the number of a fight-fan crony. After his somewhat irritable hello, I explained our situation briefly and asked him to place his telephone before the speaker of his radio. I then handed our telephone to my son and wheeled into my room where an extension instrument is located.

"In this manner we enjoyed the balance of the contest, and still had between-round discussion, even though we were listening in separate rooms."

V V

Nebraska Association Sponsors School in Accounting

The Nebraska Telephone Association reports it has completed an interesting and profitable training school in accounting procedures. Held on the campus of Kearney (Neb.) State Teachers College from Aug. 10-13, the school was the first of its kind ever offered by a telephone association.

Students and instructors who were present at the recent Nebraska Telephone Association accounting school held in Kearney, Neb.

Students from 22 Nebraska telephone companies received instruction in accounting procedures and methods under the Uniform System of Accounts. With primary emphasis upon accounting for the small telephone company, instruction included classroom and blackboard illustrations of sample entries for various ledgers and journals.

In addition, each student was required to complete a practice set of examples from beginning entries through preparation of a balance sheet and income statement. As a result, a sample set of books for one month was prepared by each student under the supervision of course instructors.

Emphasis was also placed upon the proper allocation of operating expenses among the various accounts and the interpretation and analysis of financial statements.

All materials used, along with special explanatory material, were retained in a ring binder for future reference by the students.

Approximately one-half of the students drove to and from the school each day while the remainder obtained room and board on the college campus. Among the observers was Joseph J. Brown, chairman, Nebraska Railway Commission, who expressed to the group his view that an accounting school of this type was probably the most significant undertaking for telephone men and women in Nebraska in a decade.

Course instructors were John A. Bonebright and LeRoy Sieckmeyer, Nebraska commission accountants, and James L. Morrison of Lincoln, secretary-treasurer of the Nebraska association.

The following individuals successfully completed the course presented and were awarded "graduation" certificates:

W. B. S. Hill of Keystone; Mr. and Mrs. Albert G. Lukow of Blue Hill; Herman Weissert of Eustis; Pat J. Carey of Petersburg; John C. Haines of Naponee; Mr. and Mrs. Purl B. Mock of Springview; Mrs. John Koller of Arapahoe; Mrs. Evelyn Pearson of Campbell; Mrs. Bernice Johnson of Herman; Rupert Scott of Holstein;

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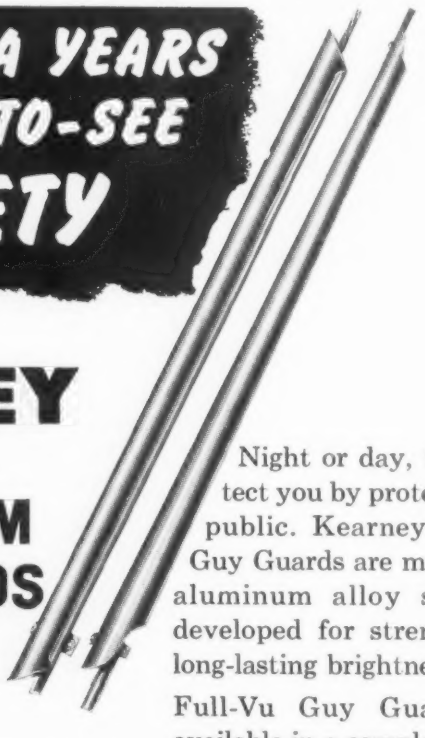

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V V

Woman Becomes New Commercial Manager of Ohio Company

The Elyria (O.) Telephone Co. has one of the few women commercial managers in the country. Miss Ruth Keith, commercial supervisor, who has been with the company for 29 years is the

RUTH KEITH

new commercial manager of the company, President Roy W. Ammel recently announced.

Hugh Conwell, who recently retired as commercial manager for The Ohio Bell Telephone Co. at Piqua, O., after 49 years' service, is now assisting Mr. Ammel in an advisory capacity in revising and modernizing the practices and routines of the company. Miss Birdie Windell of St. Louis, a Bell System veteran who recently retired as a chief operator for The Southwestern Bell Telephone Co., has been with the company for several months on a special assignment to improve the operations of the traffic department and to train several new assistant chief operators.

V V

North Dakota Independent Purchases Three Others

Dakota Central Rural Telephone Cooperative Association, Carrington, N. D., will purchase the Bohl Telephone Exchange, Woodworth, N. D.; also the Medina South Side and Woodworth Northwest telephone companies, it was reported recently.

What we want are clean treated poles that we can count on for *long* service!
Then you should use creosote. Proper pressure treatment combined with creosote of the proper specifications will give you dry, complaint-free poles that are *completely protected* against decay.

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Florida Man's Son Honored With Kentucky Colonelcy

Recently commissioned a Kentucky colonel was a son of J. N. Johnson, vice president and general manager of the Inter-County Telephone & Telegraph Co., Fort Myers, Fla.

In describing their son's commissioning for TELEPHONY, Mrs. Johnson wrote:

"A Kentucky Colonel in name and title is the distinction enjoyed by the young

man displaying his newly acquired commission in accompanying photo. Sharing the pleasure of this honor is the young man's younger brother, Davis, both boys being the sons of Mr. and Mrs. J. N. Johnson.

"Colonel Jon Johnson was born in Ashland, Ky., Dec. 8, 1943. Mrs. Johnson, attended by Nurse Opal Weber, was at a loss to name another boy—the Johnsons already had a son Jac. Mrs. Johnson didn't have any objection to any name Mrs. Weber and Mr. Johnson came up with, so they selected a military rank of Colonel as first proper name and Jon second name. The name seemed to fit his character and personality perfectly so the little boy enjoyed his name and the interest it always created. The past few years the Johnsons have been living in Florida where Colonels are retired Army officers or much older men who have had this honor bestowed upon them for one reason or another through the courtesy of genial Kentucky governors.

"Colonel Jon simply began dismissing conversation about his title by saying he was a Colonel from Kentucky he supposed. So one day Mr. Johnson, in writing to Sen. Louis Cox, president of the Kentucky Senate and a long-time personal friend of the Johnsons, disclosed Colonel's predicament.

"Senator Cox solved all problems by sponsoring a commission and Governor Wetherby came through with same—making Jon a 'Sho nuff Colonel, sir'—and probably one of the youngest on record—and most definitely *one of the youngest* if not *the* youngest in the Telephone family.

"And what does Brother Davis say? He's tickled about it, of course. He's just wondering what the military will do when they have a private Col. Colonel on their rolls. Someone is sure to get all fouled-up."

V V

Wis. Company Calls Greece—Gift to Greek College Girls

The Rhinelander (Wis.) *Daily News* on Aug. 27 carried a feature story on the first long distance telephone call from Rhinelander to Greece.

The call, a "gift" of the Rhinelander Telephone Co., connected four Greek girls who were visiting in the town while on their way to college at Yankton, S. D., with their homeland. It was made from the residence of a member of the local Girl Scout Council which has sponsored a movement to bring Greek Ranger Girl Scouts to this country for college educations.

V V

Kansas Independent Under New Ownership

The sale of the Caldwell Telephone Co. to R. L. King, of Maize, by Mrs. Clyde Caldwell and Mrs. C. H. Dierking was approved recently by the Kansas Corporation Commission (TELEPHONY, July 17, p. 47).

The business has been under the managership of J. R. Shipley since Sept. 1, 1946.

Mr. and Mrs. King were owners of the Mulvane (Kan.) Telephone Co. for about seven years, selling to Mr. and Mrs. M. E. Rambo, the present owners, in January, 1950.

V V

Toledo, Ohio, to Convert to 2-5 Direct Dialing Plan by 1957

Details of the conversion of the Toledo telephone numbering system to the two-letter, five-numeral (2-5) plan as the first step toward tying Toledo and the surrounding area into the continent-wide system of direct dialing of long distance calls were announced on Aug. 16.

Ralph Abernathy, Toledo district commercial manager for Ohio Bell Telephone Co., said the $800,000 conversion program will be completed in 1957. In Toledo proper, six new exchange names will replace the 17 names now in use.

V V

All that is human must retrograde if it does not advance.—GIBBON.

REA-Financed Company in Missouri Begins Construction

Staking of pole line routes for the new telephone system of the Grand River Mutual Telephone Corp., Princeton, Mo., has been under way since July 19, according to C. W. Chastain, company manager.

Plans and specifications for the central office equipment for the 17 central offices included in present planning were approved by REA engineers on July 27 and released for bid Aug. 3. Bids will be opened Oct. 5 and a contract awarded by Nov. 1. It is anticipated that the supplier will be able to deliver and install the first automatic switchboard about eight months after the contract, with succeeding switchboards being installed at the rate of one a month. The 2-5 numbering plan will be used.

Missouri exchanges of the company are at Mercer, Princeton, Mt. Moriah, Laredo, Galt, Spickard, Brimson, Allerton, Lineville, Cainsville and Ridgeway, Eagleville, Gilman City, Bethany, Washington Center, Jamesport and Chula.

V V

Third Annual Wire and Cable Symposium to Meet in December

The third annual Wire and Cable Symposium jointly sponsored by the Signal Corps Engineering Laboratories, Fort Monmouth, N. J., and by the wire and cable industry will be held Dec. 7 through 9, at the Berkeley Carteret Hotel, Asbury Park, N. J. The program will cover wire and cable materials, their characteristics and uses; wire and cable constructions, together with manufacturing and equipment problems; field construction methods; and uses in systems operation.

Further details are available from Mr. H. L. Kitts, Coles Signal Laboratory, Fort Monmouth.

"SHOULD RETIRE HIM. HE'S GETTING SET IN HIS WAYS."

Unlock the door to profit!

Telephones locked up indoors—or darkened booths—do not give service or bring in revenue. If you have an inside booth that is not producing, dress it up with a bright coat of paint; bring it out where people can see it, sign it and light it with the GLO-DOME Booth Conversion Kit, and watch it bring in money. Increases up to 150% are on record.

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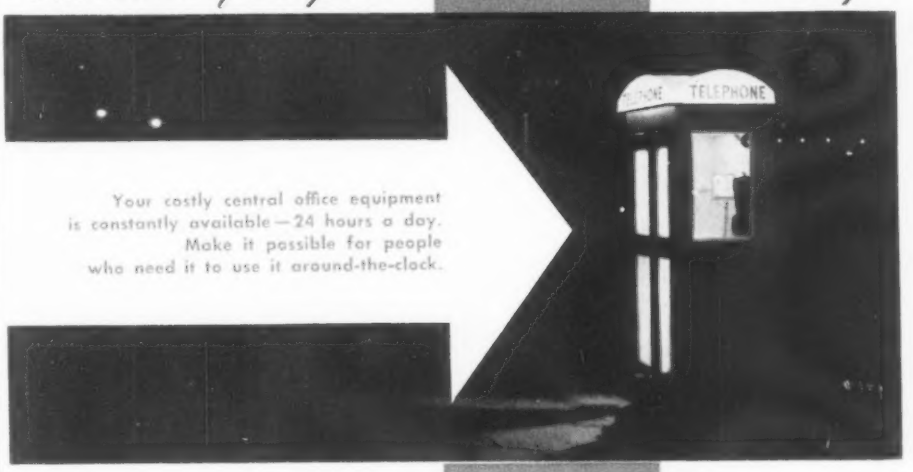

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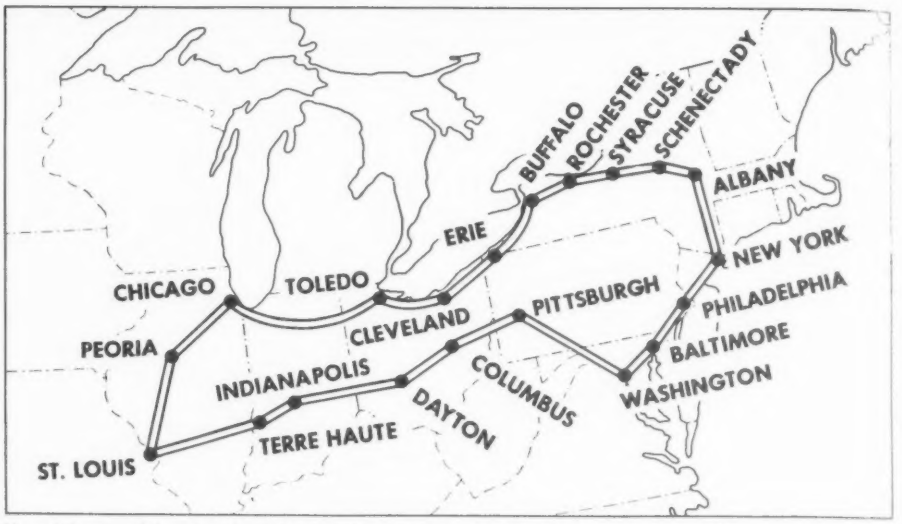


New intercity television facilities, stretching some 2,400 miles across the northeastern section of the country, and called "The Big Loop," were placed in operation on Aug. 1. AT&T's Long Lines Department says the facilities, designed to make network TV transmission more flexible, will provide four video channels along radio relay route shown above.

Long Lines Adds Channels to New York-Chicago TV Network

A new television pathway 2,400 miles long, linking stations in the northeastern quarter of the nation, were placed in operation on Aug. 1, the Long Lines Department of American Telephone & Telegraph Co. announced on July 30.

The network of television facilities provides four video channels, two in each direction, along a radio relay route extending from New York to Chicago via Buffalo and back via St. Louis, Pittsburgh and Washington.

Long Lines said the new facilities are designed to make inter-city television transmission more flexible. The route is a closed-loop arrangement of multi-station facilities. Any station connected to the route may now receive programs from any other station in the loop or transmit to the other stations with a minimum of switching.

Construction of the above new general office building for General Telephone Co. of California in Santa Monica, Cal., is scheduled to start in September. The new office will provide about 200,000 square feet of floor space. About 2½ acres in area, the new site will provide parking for 260 cars, and a basement will accommodate 70 cars. There will be two entrances to the building. A unique solution has been evolved to prevent possible traffic congestion when employes are reporting to or leaving work. Vehicles picking up employes will enter a tunnel under the building, pick up passengers at pedestrian islands in the main entrance area, and leave via an exit on another street. Design plans contemplate eventual doubling of the structure, since the company believes the number of telephones served will double within the next 10 or 12 years. Also, many employes temporarily occupying leased or rented quarters in various parts of the city will be quartered in the new building. Of steel and concrete construction, the building will be fire and earthquake resistant. Use of decorative building facings and interior plantings will create a feeling of warmth and friendliness. Cost of the structure is estimated at approximately 3 million dollars.

The route can carry programs from the major TV networks to stations in such cities as:

New York, Schenectady, Syracuse, Rochester and Buffalo, N. Y.

Philadelphia, Pittsburgh and Erie, Pa.

Cleveland, Toledo, Dayton and Columbus, O.

Chicago and Peoria, Ill.

Indianapolis and Terre Haute, Ind.

St. Louis, Washington, D. C.; and Baltimore.

V V

National Chamber Offers Study Relating Education to Earnings

The United States Chamber of Commerce recently asked the following question and went on to answer it as quoted below:

Why go back to high school, or on to college?

That's a question a lot of youngsters are asking themselves these vacation days—youngsters who have reached the age where the law allows them to quit school.

The national chamber of commerce has a bit of firm advice for these young people. Stay in school!

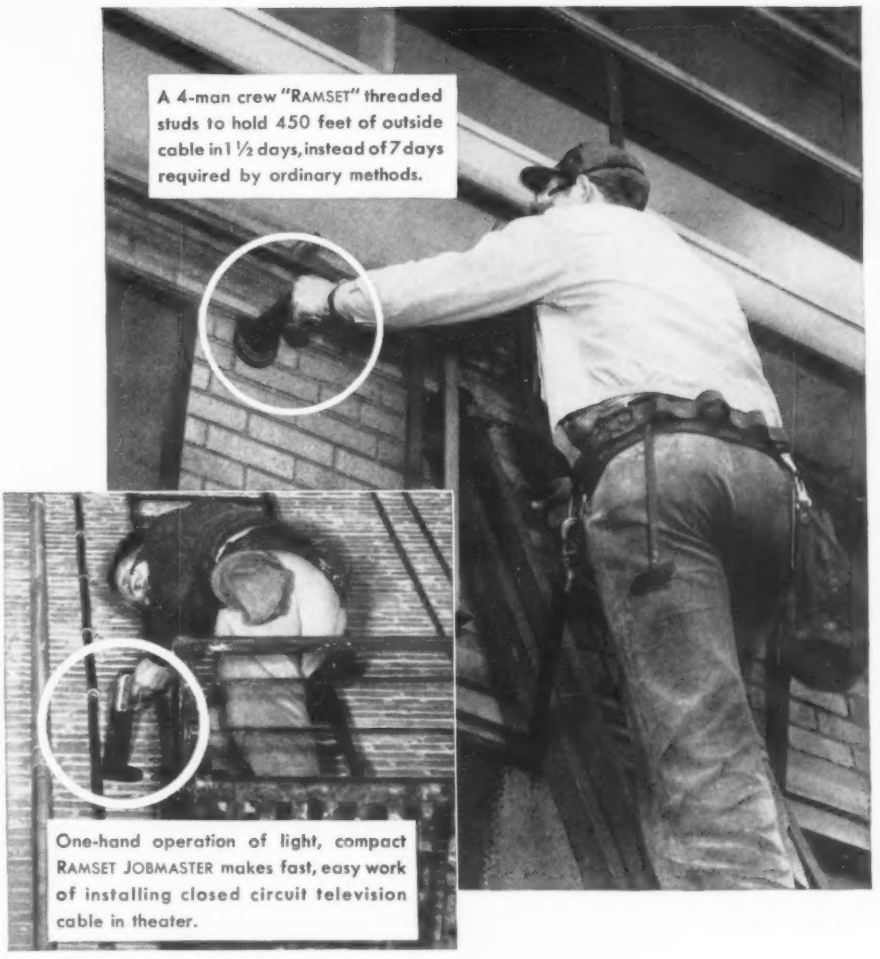
Perhaps the most appealing reason is that better educated men and women earn more money. A new chamber study shows that 82 per cent of men 25 and over earning $10,000 or more, had high school or college education, while those with an eighth grade education or less had 77 per cent of the incomes below $500.

"There is a direct relationship between education level and earning power and, therefore, buying power in our total American economy," the study points out. But the same study turned up even better reasons for getting an education.

It showed that persons with high school or college experience were likely to be more politically active than those with grammar school education, and hence better citizens. Further, better educated persons had a stronger belief in the American business system.

In a word, education helps people to be more efficient producers, more able to use and value political and economic freedom. These, the chamber points out, are the essentials of an expanding, competitive economy under representative government.

"Income and Education" is one of many points outlined in statistical charts and figures in the national chamber's study, "Education—An Investment in People." Single copies at $ .00 each are available from the chamber's education department, Washington 6, D. C.


A 4-man crew "RAMSET" threaded studs to hold 450 feet of outside cable in 1 ½ days, instead of 7 days required by ordinary methods.
One-hand operation of light, compact RAMSET JOBMASTER makes fast, easy work of installing closed circuit television cable in theater.

"Every day for 5 years we find Ramset pays off"

Amazing time and cost savings account for the continued use of RAMSET SYSTEM by the General Telephone Company of Erie, Pa. They've been profiting from easy, high-speed RAMSET since 1949, and now have 10 JOBMASTERS in constant service.

With simple, light, compact JOBMASTERS, requiring no external power, their crews make at least one fastening per minute into mortar, concrete, soft red brick, building block and steel. They use RAMSET also for new construction and maintenance work in their own buildings. In short, wherever there's a job of fastening to be done, they look to RAMSET for speed, ease and economy.

Similar experience is enjoyed by many other telephone companies who have found RAMSET SYSTEM offers the greatest utility for most fastening work. Ask your local dealer for on-your-job demonstration, or write us for details and new *Specification Manual*.

Ramset Fasteners, INC. Ramset Division, Olin Industries, Inc.

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FIRST IN POWDER ACTUATED FASTENING

AN Olin PRODUCT

New Booklet Outlines Safety Rules for Small Business

Small business is getting more help in the prevention of employe injuries.

The National Safety Council's Small Business Program, which was put on a full-time basis in 1951, has been ensured of continued progress through the increase of its grant from the National Association of Mutual Casualty Companies to $24,500. The program is now administered by a staff of three in the council's Chicago headquarters assisted by a Small Business and Associations Committee.

The added funds will enable the program to extend even more help to associations, local safety councils and other business groups, the council said. These organizations can then stimulate more than 3 million small employers to do more to control work accidents.

This approach through business organizations, which can reach and sell small firms on the benefits of accident prevention, has proved successful. Many industries and local groups report injury rate reductions exceeding 50 per cent after only a few years of organized safety effort. Individual companies continue to report impressive reductions with substantial savings in increased production, improved employe relations and public goodwill.

A. M. Baltzer, director of the council's Small Business Program, points out that the council's chief targets are the small, independent firms in both manufacturing and non-manufacturing industries. While the safety activities suggested are primarily designed to fit the needs and limited resources of firms with fewer than 100 employes, they are also applicable to any small company which desires to reduce accident losses.

To aid the small business man who has few employes and no safety staff, the Small Business Program has published the booklet, "Plus Costs." The booklet, available without charge from the council, tells how accidents eat away profits and outlines the "why" and "how" of accident control.

The booklet stresses the fact that employe injuries can be prevented in even the smallest company, without elaborate campaigns or extra staff if safety is made a part of every job.

V V

The discontent with the existing order of things pervaded the atmosphere wherever the conditions were favorable, long before Columbus, seeking the back door of Asia, found himself knocking at the front door of America.—LOWELL.

Stromberg-Carlson Names New Radio-TV Ad Manager—

David S. Cook is the new advertising manager of the radio-television division of Stromberg-Carlson Co., according to a recent announcement made by C. J. Hunt, general manager of the company's radio-television division.

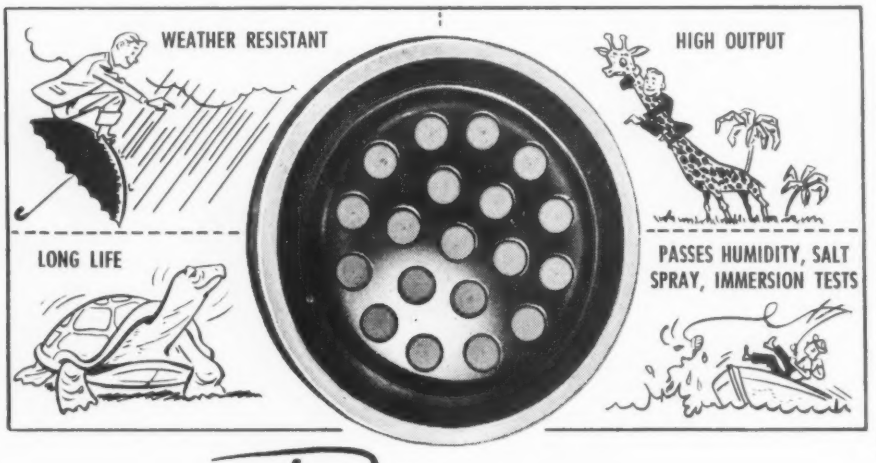
Mr. Cook has been sales promotion manager since 1946, and takes the position formerly held by S. H. Manson, the company's newly appointed director of public relations. Mr. Cook first came to Stromberg-Carlson in 1943 as editor of the company's employe publication, the "Speaker."

D. S. COOK

His previous business connection was 17 years with Collins Management, speaker and concert bureau with headquarters in Rochester, N. Y. Immediately following his graduation from Cornell University in 1924, he spent two years as an instructor and news service coordinator for the New York State College of Agriculture at Cornell.

V V

"What has become of the goals that our nation aspired to for so many years and which were considered fundamental to stability of character? What has become of thrift, for instance? We emphasize its virtues to our young people and our fellow citizens, and then permit our federal government to plunge the nation into a debt that presently averages some one thousand, six hundred dollars for every man, woman and child. What has become of integrity? We operate our businesses on the principle that honesty is one of the first prerequisites for every member of a business enterprise. Yet political expediency is accepted as a 'necessary evil.'"
—CLIFFORD F. HOOD, *president, United States Steel Corp.*



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Hubbard & Company Names Three Vice Presidents

James H. Knowles, president of Hubbard & Co., Pittsburgh, Pa., has announced the following personnel appointments and promotions:

Howard Jackson is promoted to vice president in charge of production at the Pittsburgh and Chicago plants. He

HOWARD JACKSON

has been with Hubbard & Co. since 1937, and was in charge of production at the Chicago plant. Previous to joining Hubbard, Mr. Jackson was superintendent of Stesco Steel Co., Michigan City, Ind.

Charles S. Kernaghan has been elected vice president in charge of merchandising and assistant to the president. Mr. Kernaghan had been vice

C. S. KERNAGHAN

president and director of the Waterman Pen Co. for the past 13 years and previously was with the Radio Corp. of America.

Richard G. Robbins has been promoted to vice president and general sales manager of the Pittsburgh and

R. G. ROBBINS

Chicago plants, covering the eastern and mid-western territories. Mr. Robbins joined the Hubbard organization in 1923 as an assistant to several department heads. His other positions with the company have been advertising manager, assistant sales manager, divisional sales manager, and vice president, eastern division.

Hubbard & Co. is a leading producer of pole line hardware and aluminum street lighting standards and brackets for public utilities.

V V

Gleason Named Sales Manager For Federal Laboratories

Appointment of I. W. Gleason as sales manager for systems and commercial research and development has been announced by Federal Telecommunication Laboratories, Nutley, N. J., a division of International Telephone & Telegraph Corp.

Mr. Gleason has been associated with IT&T for approximately 14 years. A graduate of Massachusetts Institute of Technology, he served with the U. S. Army Signal Corps from 1943 to 1946 and from 1951 to 1952, and holds the rank of colonel in the reserves.

V V

"It is self-evident that we are going through an altogether crucial testing time. The test, of course, is whether American business leadership uses wisely, with social responsibility and balance, its present opportunity to prove to Americans and to the world that they can solve their problems better in a free economic system than in any other."—ERWIN D. CANHAM, *editor, Christian Science Monitor.*

TAKE A BIG STEP TOWARD SAFETY WITH DUO-SAFETY LADDERS

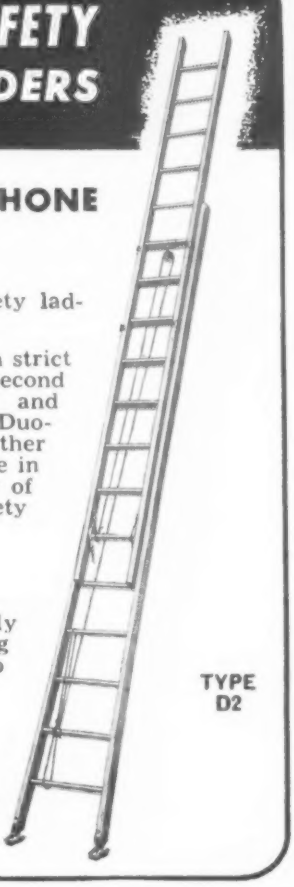
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



TYPE D2

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Electric Storage Battery Co. Elects Two Executives

The board of directors of The Electric Storage Battery Co., Philadelphia 2, Pa., manufacturers of Exide batteries, has elected Earl W. Williams treasurer and Edward J. Dwyer secretary, it was announced recently. Mr. Williams formerly was assistant treasurer of the company, and Mr. Dwyer was assistant secretary.

Mr. Williams, a native of Tonica, Ill., entered the company's employ as a ledger clerk in 1923 shortly after his graduation from Bradley University, Peoria, Ill. He successively was advanced to cashier and company auditor before being named assistant to the treasurer in 1935. He became assistant secretary in 1938, and in 1941 assumed the additional duties of assistant treasurer. Mr. Williams also is treasurer and a member of the board of Stokes Molded Products Division, Trenton, N. J., and treasurer of ESB International Corp., a subsidiary.

Mr. Dwyer is a native of Norwalk, Conn. After receiving a bachelor of arts degree at St. John's College in 1930, he enrolled in Johns Hopkins University and was granted a Master's degree in Mechanical Engineering in 1933. Five years later he earned a Doctorate of Law at George Washington University.

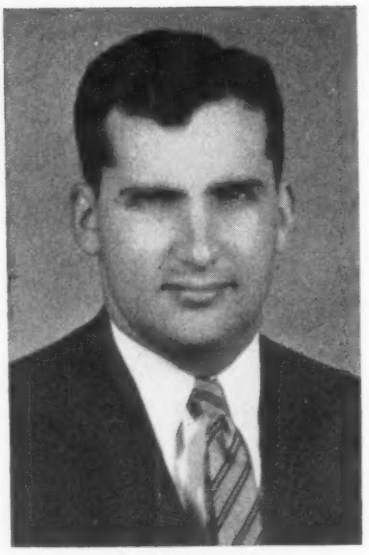
For several years he was employed by General Electric Co. In 1941 he was appointed patent attorney by The Electric Storage Battery Co. and in 1948 became assistant secretary. In the latter capacity he has been largely responsible for the company's stockholder relations program as well as directing the activities of the legal department. He also is secretary and a member of the board of ESB International Corp., and secretary of Exide Batteries of Canada, Ltd., another subsidiary.

Dwyer is a member of American Bar Association, and has served on committees of the association's patents, trademarks and copyrights section. He is also a member of the patents committee of the National Association of Manufacturers.

V V

I.B.M. Appoints Representative For Communications Field

International Business Machines Corp. recently announced the appointment of Ralph A. Pfeiffer as a special representative in the communications department. He previously was an electric accounting machine sales representative in the company's Cleveland office. In his new post Mr. Pfeiffer will assist in planning applications of IBM equipment to meet the accounting requirements of firms in the communications field.



R. A. PFEIFFER

Mr. Pfeiffer joined IBM in 1949 in Cleveland and served in that city in various sales capacities until his present promotion. He is a graduate of John Carroll University.

V V

General Announces Purchase Of Alphaduct Wire & Cable Co.

General Telephone Corp. has purchased all of the outstanding stock of the Alphaduct Wire & Cable Co. of Milltown, N. J., it was announced on Aug. 26 in New York City by General Telephone Corp. president, Donald C. Power.

The Alphaduct Wire & Cable Co. is engaged primarily in the manufacture of insulated wire used by the telephone industry. Management changes include the election of Edward S. George as president. He was formerly treasurer of the company.

V V

Stromberg Retains A. H. Bergeson As Consulting Engineer

Andrew H. Bergeson, who recently retired from active duty in the U. S. Navy with the rank of captain, has been retained by the Stromberg-Carlson Co. as a consulting engineer, according to an announcement made recently by Robert C. Tait, president.

Capt. Bergeson has an outstanding record and background of experience in the fields of electronics and communications with the Navy, according to the company. He graduated from the U. S. Naval Academy in 1927 with a B.S. degree, and a commission of ensign. Later he took postgraduate courses at Annapolis in radio, engineering and communications, and at the Harvard University Graduate School of Engineering, where he graduated in 1938 with an M.S. degree in radio engineering. His most significant duties during his career with the Navy include:

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UNION, MISSOURI

A. H. BERGESON

(1) Communication and radio officer, staff of commander aircraft scouting force and staff of commander aircraft, Atlantic fleet (1939-1941). He originated basic planning for the expanded naval aviation communication and navigational systems to meet the World War II threat. He also directly supervised the electronic activities of the many shore bases, ships and aircraft attached to the fleet command.

(2) Head of aviation electronics branch, Bureau of Ships, Navy Department, Washington, D. C. (1941-1944). He directly supervised the research, development, design and production of the Navy's aviation electronic equipment.

(3) Commanding officer of the U.S.S. Chourre which operated in the West Pacific.

(4) Director electronics division, Bureau of Aeronautics, Navy Department, Washington, D. C. (1946-1949).

He resumed direction of the research, development and design of all Naval aviation electronic and electrical equipment. Captain Bergeson served on several important committees during this period, including Navy member of the electronics committee of research and development board, and member of SC-31, a special committee of the RTCA appointed to recommend long-range plans for the country's Air Navigational System. All members jointly received the "Colliers Aviation Award" for this work.

(5) Navy representative for Project Lincoln (1951-1954). Captain Bergeson directly represented the Navy in the operation of the highly secret Project Lincoln. This joint project managed by the Massachusetts Institute of Technology is principally concerned with the utilization of new technological "break throughs" in this country's Air Defense System.

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12 RECORDAK MICROFILM READERS, model M.P.E., in excellent condition and about three years old. This is an opportunity to obtain additional Readers for use with your Microfilm Toll Billing and other records at a big price saving. Write Box No. 3530, c/o TELEPHONY.

1 STROMBERG-CARLSON #120 COMMON BATTERY P.B.X., 70 lines with line relays, 5 trunks. Reconditioned and refinished. Photo on request. Write Box No. 3538, c/o TELEPHONY.

TWO EXCHANGES IN SOUTHERN MICHIGAN — 816 and 624 stations. Gross over $76,000. Price $88,200. Write Box No. 3543, c/o TELEPHONY.

100-LINE NORTH ELECTRIC MCX SWITCHBOARD, three paystations lines, three trunks, 13 line PBX group, Leich harmonic pole changer five frequency, two 3-amp. Raytheon chargers, one B-type MDF with protectors and terminal blocks. Available now and ready to operate. Set up in frame building—optional. Also 11,745 feet 51-22 DSA cable on reels—brand new. Make offer. If interested contact Mid-Plains Rural Telephone Cooperative, Inc., Tulia, Tex. Telephone 5-2700.

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ONE C. B. UNIVERSAL 200 line Stromberg-Carlson Switchboard. 11 cells battery and ringing machine, Auto rectichargeer, Western Electric Mainframe and C. B. phones. If interested contact Chester Telephone Company, Chester, Montana.

100, 3-BAR WESTERN ELECTRIC magneto wall phones. Very clean — $5.00 each. One Repeat Coil with protected housing—$15.00. One, 86A Leich handset — $10.00. Write Tri County Telephone Co., Walbach, Neb.

CARRIER: Kellogg Type 5A2 and Power Supply No. 105. Both ends of first channel, stackable type—still in original cartons. Available for immediate shipment. Price—$1345. Reply to Box No. 3541, c/o TELEPHONY.

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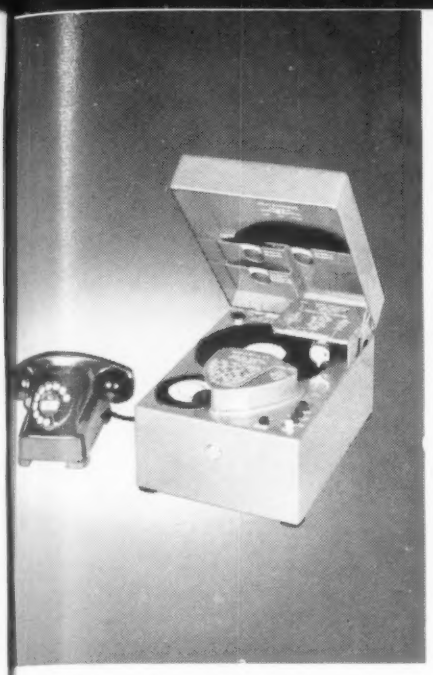
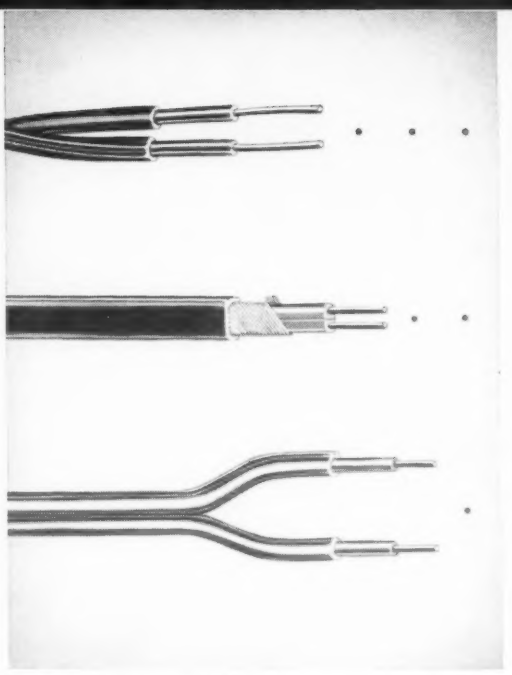


…ophone Answers the Telephone automatically …scriber records his own "talk-out" mes… on the instrument, advising where he can …ached or when he will return. Talk-out …ages can be used indefinitely, recording is …ment.



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For Plastic Covered Cable—the new P-L-X Cable Terminal is simple to install—designed for maintenance free operation. Front of unit opens down for working ease. No stubbing, no splicing, no potting makes it simpler and economical. COOK ELECTRIC COMPANY.

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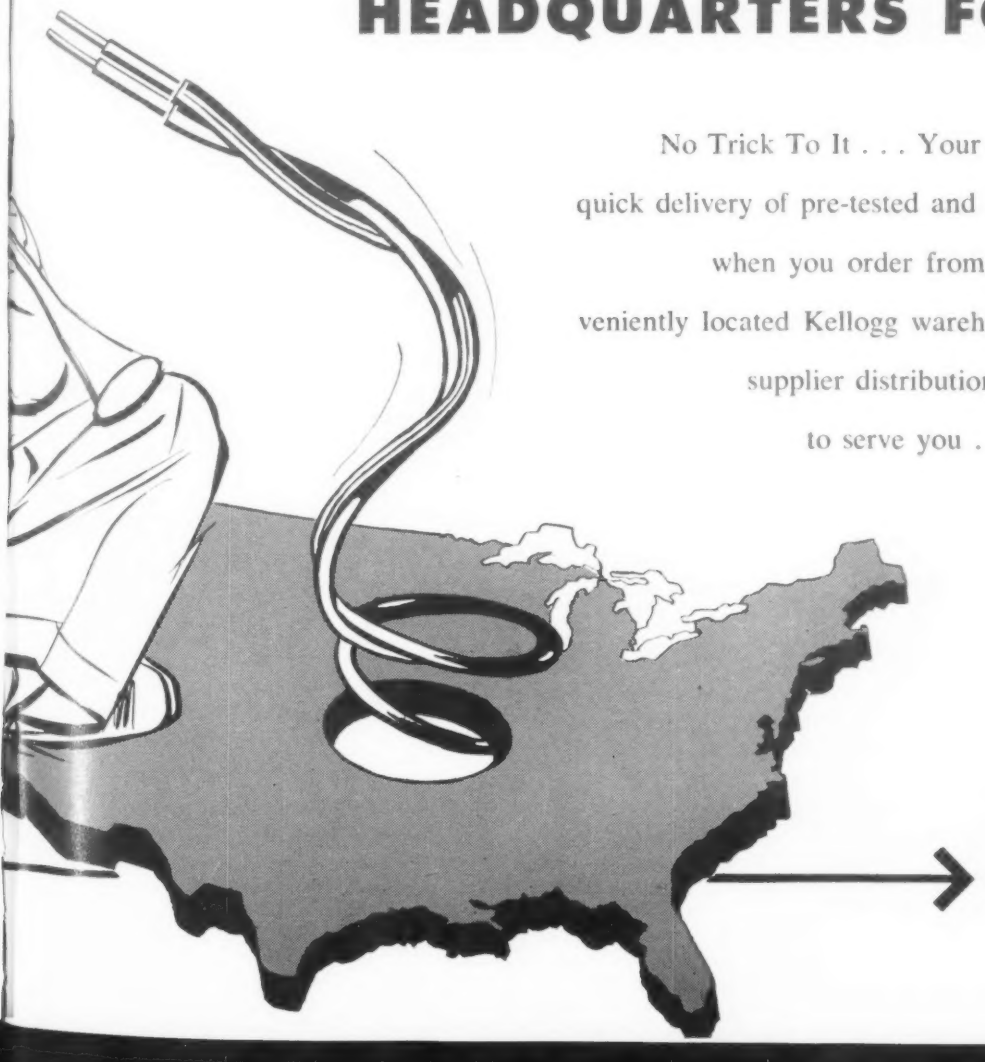

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